

THE IRON INDUSTRIES OF MONMOUTHSHIRE.

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The shire of Monmouth includes within its area the eastern extension of the great South Wales mineral basin, which basin occupies the greatest part of the adjoining counties of Glamorgan, Carmarthen, and Pembrokeshire. This great coal tract occupies about 900 square miles, and extends from Pontypool on the east, to St. Bride's Bay on the west. The section of the coal field in Monmouthshire, to which more especial notice will now be given, is well defined by the River Rumney on one side, separating it from Glamorganshire, the northern boundary being traced by a line extending from Merthyr, through Ebbw Vale, to Blaenavon, and southwards by Pontypool, through Risca, where it connects the southern outcrop of the coal field. The length of this section of the coal field from the River Rumney, near Merthyr, to Risca is about 15 miles; the average width from the River Rumney to the eastern outcrop not exceeding seven miles, or an area of 105 square miles, nearly one-ninth part of the whole area of the South Wales coal field. The coal measures of this great basin (resting on the millstone grit), with its associated shales, ironstones, sandstones, and the 25 coal seams, of more than 2 ft. thick, measure, according to Prof. E. Hull, F.R.S., 11,650 ft. The 25 seams of coal giving a total thickness of 84 ft. of solid workable coal.

These coal measures are divided into an upper and lower series, separated by an important arenaceous rock, of great thickness and economic value, not only in this area of Monmouthshire, but also in the Welsh Forest of Dean, and the Bristol coal fields, and known as the "Pennant grit series." In these upper coal measures occurs the celebrated seam known as the "Mynydd Isslwyn" coal seam, now nearly exhausted, 5 ft. 6 in. thick, and greatly esteemed as a house coal. Beneath this seam, and before the "Pennant grit" is reached, are 26 seams of coal, 9 of which exceed 2 ft. in thickness. In the lower coal measures, according to Prof. Hull, are 34 seams of coal, 8 of which exceed 2 ft. in thickness; it is in these lower measures that the principal repositories of ironstone are found. These seams, which are extremely numerous, rarely exceed 5 or 6 in. in thickness, and frequently contain remains of marine shells, fish, and plants. It has been observed that the ironstone seams are, on the average, richer in yield of metallic iron on the east, and that, while increasing in thickness, on the west they become poorer.

The following are the more important of the ironstones of the district used in making iron, and the localities from whence obtained, where they are widely distributed. On the eastern outcrop, at Blaenavon and Abersychan, are the "Soap Vein Mine," the "Black Pins," the "Three-Quarter Balls," and the "Meadow Vein Mine," or "Pwll Llaca," and two or three others of less importance. At Pontypool blackband ironstone occurs varying from 4 to 8 inches in thickness over the Red Vein coal. In the neighbourhood of Coalbrook Vale is the "Soap Vein Mine," consisting of four courses or bands of 7 in. thick, and yielding about 2000 tons per acre; below the Soap Vein Mine occurs a measure of blackband of a single course, worked locally, but only to a limited extent. The "Black Pins," a measure of ten irregular courses of nodules, and yielding an average of 4500 tons of ironstone per acre. The "Three-Quarter Balls," somewhat irregular, and yielding 1200 tons per acre. The "Spotted Pin," two courses of 4½ in., the yield per acre being about 1200 tons, and the "Red Vein," a measure of three courses of 6½ in., yielding 1800 tons per acre. At Nant-y-Glo and Beaufort blackband occurs over the old coal, and at Sirhowy and Tredegar over the Ell coal.

Again, at Nant-y-Glo are worked the "Little Pins" and "Big Vein," the former consisting of two courses, equal to 5 in. of ironstone, and yielding 1200 tons per acre; the latter also of two courses, yielding about 1700 tons per acre, and resting on the "Bottom coal." The total thickness of measures in this section at Nant-y-Glo from the Soap Vein Mine to the Bottom coal is about 450 ft. The ironstone measures of Monmouthshire are richer in metallic iron than those westwards in the South Wales coal basin, where to the west the measures thicken, as previously stated, but at the same time are found to become less rich in metallic iron. For many of the facts contained in the foregoing we are indebted to the late Mr. Samuel H. Blackwell, of Dudley, who many years since reported very fully on the iron-making resources of the United Kingdom.

PRODUCTION OF IRONSTONE.—The statistical information under this head is so closely associated with the returns of the South Wales mineral basin, that we are not enabled to carry out our plan of comparison by calling attention to the increased production of the district year by year. We have, however, sought all available information bearing on the question, and give in detail such returns as are accessible. The earliest of these returns is for the year 1857, when the detailed production of the ironstone measures was ascertained as follows for that year—

District.	Monmouthshire.	Tons.
Abersychan		43,098
Beaufort		74,600
Blaenavon		80,111
Blaina		
Coalbrook Vale		73,207
Cwm Celyn		34,000
Clydach		37,567
Ebbw Vale		41,200
Pontypool		65,886
Sirhowy		86,182
Tredegar		56,133
Varteg and Golyntos		60
Varteg Hill		
Victoria		15,852
Total		607,896

It would have been instructive could we have carried the comparison on in subsequent years, but this has not been found practicable, inasmuch as later returns of the production of this district is included in that of South Wales;—in the year 1869, however, we have a separate return, which showed that 360,000 tons of ironstone was raised in the district, and for which returns were received by the Keeper of Mining Records. Experience, however, shows that this quantity falls far short of that produced, and general knowledge of the condition of these industries at that period convinces us that at least 180,000 to 200,000 tons may be considered as the additional quantity produced within the area for which no returns were received. The foregoing remarks also apply to the year 1873, when the actual returns of these districts, as ascertained by the Mining Record Office, were as follows of the ores of the argillaceous carbonate of iron, to which may be added at least from 15 to 20 per cent. of ores, for which no returns were obtainable: this would bring the total production up to 600,000 tons:—

District.	Quantities.	Value.
Blaenavon	65,527	£ 41,116
Ebbw Vale, &c. (estimated)	200,000	120,000
Nant-y-Glo, &c. (estimated)	160,000	96,000
Rhymney	31,079	19,247
Tredegar	36,326	23,595
Cwmbran	2,902	1,681
Total	502,734	301,639

It should be noted that in the Ebbw Vale return the production of Abersychan, Pontypool, and Sirhowy districts are included; while the Nant-y-Glo return includes that produced in the Blaina and Beaufort districts. The average price of these ores in the year 1873 may be taken as nearly 12s. per ton.

PRODUCTION OF COAL.—In a very interesting paper "On the Port of Newport and its Coal Fields," read before the South Wales Institute of Mining Engineers in the year 1867, we find some valuable facts bearing upon the quantity of coal in this district available for future use. Its author, Mr. A. Bassett, C.E., and a past President of the Institute, says that having ascertained the total thickness of the coal beds in every part of the county, and calculating the yield at the rate of 1000 tons per acre per foot in depth of coal, that there existed previous to the commencement of the present century 2,115,000 tons of coal, of which 115,000 tons were exhausted up to the year 1867, leaving 2,000,000 tons available for future use since that year.

The returns of coal of this district, like those of the ironstone, are so closely identified with the production of South Wales that it is only occasionally we are enabled to draw a comparison. In the year 1863 the collieries of Monmouthshire numbered 104, including a few

on the edge of Glamorganshire; the coal produced amounted to 4,075,000 tons. Again, in the year 1865, the same collieries yielded 4,125,000 tons of coal, showing an increase in two years of 50,000 tons. Advancing to the year 1866 the return of production shows an aggregate of 4,445,000 tons, the distribution of which was ascertained as follows:—

Distribution.	Coal.
Used in ironworks.....	Tons 1,800,000
Colliery consumption.....	400,000
Local consumption.....	2,000,000
Carried out of district by railway.....	100,000
Shipments.....	145,000

Total of Monmouthshire 4,445,000

The reports of the Inspectors of Coal Mines recently published show that in the year 1864 there was raised from the coal mines of Monmouthshire 4,226,592 tons, affording employment to 18,425 persons, of whom 15,073 were employed in the various underground operations, the remaining 3355 being employed aboveground. These figures would give for the year 1864 an average yield per man of about 280 tons; while the number of fatal accidents in the production of 4,226,592 tons of coal amounted to 38, which gives an average of 111,226 tons of coal to each life lost—a proportion by no means high when the fiery character of some of the seams worked is taken into consideration.

Of the production of Monmouthshire, the coal of which is of a coking bituminous character, and in great request for household purposes, there was exported from the port of Newport the following quantities in each of the years named since 1820:—

Years.	Coastwise.	Total exports.
1820.....	Tons 193,662	193,662
1825.....	372,456	374,882
1830.....	—	1,930
1835.....	443,651	2,823
1840.....	482,398	7,256
1845.....	485,402	149,890
1850.....	426,439	125,245
1855.....	474,873	187,647
1860.....	629,206	187,591
1865.....	639,231	292,700
1870.....	795,192	308,394
1871.....	798,928	369,223
1872.....	781,538	236,068
1873.....	780,001	305,520

In addition to the above-named quantities shipped from the port of Newport, we find the Monmouthshire Railway and Canal Company carrying the following quantities of coal in each year since 1868:—

Year.	Quantities.	Year.	Quantities.
1868.....	Tons 1,389,690	1871.....	Tons 1,741,748
1869.....	1,528,354	1872.....	1,759,559
1870.....	1,676,486	1873.....	2,093,002

The returns for the year 1874 are not yet published; the quantities carried, however, are believed to be in excess of the previous year, while for the first six months of 1875 a considerable falling off will have taken place in the quantities of coal and minerals carried by the Monmouthshire Railway and Canal Company. The directors of this company recently in the present month recommended a dividend at the rate of 2 per cent. per annum for the half-year; this is a great reduction, the last dividend being 6½ per cent., and the dividend for the corresponding half of last year being 7½ per cent. The line, however, has suffered in its carrying trade with the Taff Vale, from the protracted strike and lock-out in South Wales. The low dividend has had no effect on the price of shares, as the arrangement with the Great Western Company guarantees a permanent dividend for the future at the rate of 6½ per cent., and a participation in the profits.

ANALYSES OF THE COAL.—The coking bituminous character of the coal of Monmouthshire, as previously stated, renders it of great value as a reducing agent in the blast-furnace. The following shows the composition of the seams noted:—

Charcoal vein.	Rock vein.	Black vein.
Carbon 81·26	32·25	81·78
Hydrogen 6·31	5·84	4·73
Nitrogen 0·77	1·11	—
Sulphur 1·86	1·22	6·69
Oxygen 9·76	3·58	—
Ash 2·04	6·00	6·80
Total 102·00	100·00	100·00

The proportion of coke yielded by the above and other seams being as follows:—

Coal seams.	Per cent. of coke.	Coal seams.	Per cent. of coke.
Charcoal vein	68·49	Ell vein	70·00
Rock vein	68·93	Three-quarter Rock vein	62·50
Black vein	71·80	New Black vein	68·09

ANALYSES OF THE IRONSTONE.—The argillaceous ores of Monmouthshire, like those of our other coal fields, considered in previous notices, are well represented in the collection of the iron ores made by the late Mr. Samuel Blackwell, of Dudley, now deposited in the Museum of Practical Geology in London, and of which complete analyses are to be found in Part III. of the Iron Ores of Great Britain, published in 1861. These analyses were made in the laboratory of the Royal School of Mines, and details of the composition of one or two of these ores show generally their chemical character,

Results tabulated.	Spotted Vein Mine.	Spotted Vein Mine Ball.
Protioxide of iron	45·22	44·50
Protioxide of manganese	1·05	0·73
Alumina	0·58	1·35
Lime	1·63	1·91
Magnesia	3·04	2·47
Carbonic acid	31·53	30·92
Phosphoric acid	0·38	0·23
Sulphuric acid	Trace	—
Bisulphide of iron	0·71	0·11
Water	0·66	0·76
Organic matter	0·64	0·21
Insoluble residue	14·50	

called traps, probably from a northern word signifying step, and the elevation or subsidence of the strata is described as their trap, up or down. The change of level occasioned by these dislocations sometimes exceed 500 ft.; whence we may infer the immense violence of the convulsion which had the power to produce motions of such vast masses to such an extent. The Hutton seam throughout the royalty of the Alexandra pit was exhausted some years ago, and the seams now being worked include the Main coal, the Low Main, and the Maudlin seams. The Main seam has already been more than half got, so that the principal output for the future will, of course, be confined to the two latter seams. A large number of old pits in the neighbourhood have been abandoned many years, and these include the shafts known as the North pit, Hunter's house pit, Meadows pit, the Resolution pit, and many more. These shafts were abandoned upon the introduction of the safety-lamp, which enabled miners to work larger areas with fewer shafts than formerly. The derelict pits are now used for ventilating purposes.

At the Alexandra pit a pair of coal-cutting machines have been brought into requisition, and, so far, they have answered admirably. These machines have been found not only of value in the economy of labour, but an immense saving is secured by minimising the breakage, inasmuch as by the ordinary system of hewing, in the after seams, the small coal averages some 50 per cent. of the whole, whilst in the machine-got coal this waste is reduced to a mere fraction. The machines are worked by a surface engine, from which is carried an air tube into the workings for supplying the necessary air, and which thus becomes the motor for driving the machinery. The boro and pillar system is carried out, and the hauling is done by means of a tail-rope and endless chain. The coals are principally used for steam purposes, and are shipped at Sunderland, Seham, and the Tyne Dock, at each of which places the Marquis of Londonderry has staiths. No person can sail down the Tyne from Newcastle Bridge to North and South Shields, a distance of 10 miles, without being exceedingly struck with the appearance of these immense structures of timber, erected at a short distance from each other, on both sides of the river. These Staiths have often been the subject of litigation and complaint, as well as of rioting, especially on the part of the keelmen, on account of their projecting so far into and over the river as to impede the navigation.

The Rainton collieries occupy a position to the north-east of the coal basin, and the pits connected therewith are provided, as indeed are all the collieries owned by the Marquis, with ample educational advantages, religious accommodation, as well as means for social and mental recreation.

THE LLANDILLO SILVER-LEAD AND BLENDÉ COMPANY.

A very important company has been formed under the above designation. The capital is small, and the objects contemplated are certainly not of magnitude, but, nevertheless, it is important. In the present condition of the mining interest every new enterprise reasonable in its objects, and under proper guidance, is a matter of gratulation and hope.

Mining is undoubtedly depressed, and it is so in great part from adventurous circumstances, and because bad management and hopped-and-go-venture companies have brought disrepute. This is a bona fide undertaking and the metalliferous qualities of the mine are just of the kind desirable for producing silver, lead, and blendé, all of which are very much wanted, and have to be imported, and the use of all which is making rapid progress, not only in British, but in European and American social requirements.

As to silver, in all the parts of the world just named it is intensely coveted for domestic purposes. The conviction is general that breakfast and evening services in families should be composed of this one metal or china, except so far as gold may be employed in the bowls of salt spoons, and a few other purposes, but "the prince of metals" is too costly except for the very wealthiest classes. It is certain that the use of silver as plate, and for many purposes in connection with the arts, and the manufacture of scientific instruments, will increase as it is pushed out of the monetary circulations of nations by the introduction of gold, a process now going on in Holland, Germany, France, and the United States, who are all gradually adopting the metallic standard so long in use among ourselves. There are properly no silver mines in this country, they are as the mine which is the subject of this notice, "silver-lead" mines. "The silver mines of Tipperary" come nearest the designation, but they also are silver-lead."

The use of silver in this country is very great. Our imports during last month were of the value of over a million, and for the seven months of the year already transpired close upon six millions. All we get last month we sent away in consequence of the heavy demand for India, where it is enormous and continuous, and has been since the days of Pliny, who recorded it as a fact in his day. The discovery of an argentiferous property is of great concern, not simply because silver always brings a good price, but of its vastly growing demand. Lead is also in increasing request; our mines do not produce all we consume. We imported last month pig and sheet to the value of 171,234L, and during this year, so far as it has gone, to the value of 1,034,261L. These figures do not materially differ from the corresponding periods of other years, for lead commercially is the cheapest of all metals, and its production is not progressive, measuring it either by past production or present wants. Of the lead we imported at so great a cost it does not appear that we exported a single ounce. Of British leads our exports, valued for the month, was not 40,000L, and for the seven month less than 7,000L. From these figures it is evident that we do not raise lead enough for our own consumption, and that the metal is so comparatively high priced that we cannot create an active export trade in it as yet. Our limited trade in lead does not arise because there is an extensive want for it. What has been exported was sent to Russia, Germany, France, China, India, Australia, &c. The United States of America, which used to be an excellent customer, did not take a pound weight from us during the past seven months, a circumstance which should be examined, and means speedily adopted to revive the trade.

The Llandillo Silver-lead and Blendé Mine is reported as likely to prove as rich in silver-lead and ore as any mine in South Wales. Of the products of this property is blendé, or zinc ore, and no mineral is growing more rapidly than the constituents of such, as we proved some time ago in a leader of the *Mining Journal*. Lead itself in many of its uses is being pushed aside by zinc, and so is brass, into which zinc itself enters. Our imports of zinc this year so far were of the value of close upon 57,000L, 20 per cent. more than during the same space of time last year. That the call for zinc is rapidly progressing is plain enough from the fact that a great deal more than half of the whole seven months imports was entered last month. But, as an Irishman would say, this is the smaller half of the story, for manufactures of zinc were imported this year so far to the amount of 102,000L, against 68,000L in the corresponding period of last year, and 55,000L in that of the year before. A most decisive proof of the rapid progress of our wants in respect of this metal. Taking the month's import under this branch of the zinc trade, and the comparison is still more favourable. The import for the month was of the value of 80,000L, about half of that of the whole seven months, so that the July import equalled that of the other six months. It exceeded July 12 months by 33 per cent., and July before that by 120 per cent. There are, in fact, no imports which show such a progress.

As we want all the zinc or spelter (the commercial name) which we receive there cannot be much of an export trade in it, but some small quantities of British spelter are sent abroad. The Llandillo Mine yields all these commodities which are so necessary to us; and all events, so far as lead and blendé are concerned, they can be obtained among ourselves if British capital, instead of being swamped in mad foreign enterprises, be employed at home.

The Llandillo Mine is situated in Carmarthenshire, within 25 miles of Swansea, and the object of the company is to procure by lease or otherwise the power to work it. The machinery and all other appliances are complete. The mine was worked before, when the blendé was valueless; now it is a source of vast and growing profit, and will be abundantly remunerative. The capital proposed is a small

one (3200L), because as fast as the blendé is raised it can be taken to market, and it does not require a large capital to bring out produce which may at once be realised. The shares are 50L each, to be paid up. The royalties are light, the mine is prolific, its situation is commercially convenient, and it is in all respects a safe and satisfactory undertaking.

THE MINERAL RESOURCES OF THE SOUTH-WEST OF IRELAND—No. XVIII.

[FROM OUR SPECIAL CORRESPONDENT.]

DURRUS.—The short sketches of the mines I have given up to this date refer to the mineral districts south of Dunmanus Bay, at the head of which is the pleasantly situated little town of Durrus, formerly known as Carrigbuie. Between 30 and 40 years ago there was but one tolerably decent house in the place, which served the purpose of shop, hotel, and public-house all rolled into one. I have seen in this hostelry a cow and other animals standing along side the counter, apparently quite at home; a few miserable thatched smoky cabins formed the village. A few years since old leases fell in, and Lord Bandon, the proprietor, cleared away all the cabins, built an excellent hotel, post and telegraph offices, petty sessions court house, also numerous neat cottages. There are good shops, corn mills, and tucking mills, monthly fairs, and an enormous business done in butter and eggs; so that where a few years ago there only existed filth and misery, there is now comfort, cleanliness, and prosperity—the result of the fostering care of an excellent resident landlord.

I now proceed to describe briefly the mineral districts north of and parallel with Dunmanus Bay. About a mile north of Durrus there is the great valley of Coonkeen, north and east of which are extensive mountain ranges, in which six parallel copper lodes have been very superficially opened by sinking a few shallow pits. The lodes, however, so far seen are likely to produce large quantities of ore, for in every pit there is rich ore and carbonate of copper, and if the vein stuff had been saved it would have paid the cost or more of sinking the pits. Coonkeen Valley will eventually be the site of extensive copper mines. The lodes are intersected by a large cross-course, and the rivers running through the valley may be utilised in various ways. From Durrus to the Sheep's-head—the western point of the peninsula of Mintervauria, which divides Bantry Bay from Dunmanus Bay—the distance is about 25 miles. The lodes of Coonkeen run through the Mintervauria Mountains, which teem with mineral wealth, and will be described in another paper. I may remark, in passing, that in other parts of Lord Bandon's property in the locality of Durrus there are numerous lodes, containing rich copper ore, even at the surface. I have seen large boulders containing rich grey ore, but the district is not only unknown but unexplored.

North of Durrus Glebe, in the old road leading to Rooska, may be seen cropping up at surface a variety of roofing slate, and extensive quarries may, no doubt, be opened in this direction. Just above Sea Lodge there is another large vein of roofing slate, which may be advantageously worked by driving a short tunnel into the hill, to intersect the vein and drain off the water. Rossmore Slate Quarry is about 3 miles to the west of Durrus, and situate close to the public road. The vein going west skirts the north shore of Dunmanus Bay for a great distance, and finally runs into the bay; going east runs inland. This quarry was partly opened, and cargoes of first quality slate raised, but the whole width of the vein was not seen. The rubbish may be tipped into the sea, and the slate dressed and shipped direct from the quarry. The slate is thinly laminated, very durable, and of good colour. The situation is all that could be desired, and the quarry with proper management would pay well.

THE MINERAL RESOURCES OF NEW ZEALAND.

A highly interesting report has recently been made by Mr. G. H. F. ULRICH, F.G.S., on the Auriferous Quartz Reefs and Crushing Machines of the Province of Otago, New Zealand, with remarks on the auriferous drifts and occurrences of copper ore, cinnabar, grey antimony, and brown coal in different parts of the province. Under the guidance of Mr. D. MacKellar, the Secretary for the Gold Fields, he visited all the principal quartz mining localities of the province—Tokomairiro, Taupeka, Waipori, Bendigo, and the Carrick Range near Cromwell, Arrow, Skipper's Creek, the Rough Ridge, Macrae's Flat, Shag Valley, Green Island, and Portobello, besides examining most of the quartz reefs in work or opened, and the crushing mills existing in each district. As to the nature of the country rocks in which the reefs occur or gold has been found in the matrix, he states that with the exception of those of the auriferous locality near Portobello the rocks exist throughout of metamorphic schist. Only at two places within the extensive metamorphic district he obtained evidence of the existence of an intrusive rock. Massive occurrences of granite, such as characterise the neighbourhood of most of the Victorian gold fields, are quite absent. As a general rule, both the phyllite and mica schist, but more especially the latter, are rich in interlaminations of quartz, generally from less than one-fourth to near one inch in thickness, but sometimes assuming considerable dimensions—1 ft. to 3 ft. in thickness—though with no regularity or permanency in strike and dip.

Saddle Hill, Gabriel's Gully, O. P. Q., and Canada reefs, are true lodes, promising permanency in depth. They have well-defined foot and hanging walls and clay casings or selvages, and cross the country (phyllite) both in strike and dip, though the difference in angle, either in strike or dip, or sometimes in both, is generally not considerable. In their structure, development, and mode of occurrence they resemble very closely a certain class of Victorian reefs, called "block reefs," the typical characteristic of which is, that they are composed of generally a number of blocks of quartz, either with contractions of the lode fissure between, or, what is the case here, alternating with blocks of mullock—the latter term meaning gangue matter, consisting of country rock slipped into the lode fissure, where in course of time it became more or less mineralised, impregnated with pyrites and traversed by small quartz veins. These quartz and mullock blocks, which reach sometimes considerable dimensions, extend hardly ever vertically downward, but show an endlong dip in strike within the fissures—north or south, east or west as the case may be—in the same reef invariably in the reefs of the same district generally in the same direction.

The reefs of Bendigo and the Rough Ridge, Conroy's Gully Reef near Alexandra represent in certain respects "block reefs" though with this difference from the true reefs of this class, that blocks of quartz and mullock of irregular size and outline are more or less irregularly intermixed, and do not, as those of the latter do, dip at certain angles, and in the same direction in strike. Most of the reefs of Bendigo show well-defined walls with clay casings, strike nearly uniformly east and west, are mostly traceable for long distances, and—what constitutes them very "strong" ones in mining sense, and indicates permanency in depth—they traverse horizontally, or very flat-bedded mica schist vertically, or at very steep angles. The reefs of the Rough Ridge vary in strike, though not at large angles, and most are not traceable far in strike. They are generally not so well defined as those of Bendigo, and seem liable to frequent irregularities in strike and dip, contractions, and more especially to being faulted by slides; these unfavourable features are apparently the results of surface disturbance only, and may disappear in depth. It is not uncommon, both at Bendigo and Rough Ridge, that reefs split in strike into branches, which, though deviating at first from assume gradually again the strike of the main reef, and run thus pretty close and parallel together, some increasing to the same, or even a greater, thickness than that shown by the latter. With regard to the prospects of the reefs in depth, he considers them where the reefs are well-defined as very favourable both as concerns persistency in auriferous character and regularity in average size, but in speculating upon profits the comparatively small size of the reefs, expenses connected with getting rid of the water, and the greater difficulty in extracting the gold from the quartz must be considered.

The generality of the reefs of the Carrick Range present in several respects quite distinctive characters from the reefs of the other groups. They are peculiar clayey ferruginous mullock reefs, or

rather quartz mullock reefs, so soft that they can mostly be worked by pick without the aid of boring and blasting; and the quartz, which apparently forms no large percentage of their mass, occurs only in the shape of coarse sand, and small angular and slightly rounded pieces—such reaching or surpassing the size of a fist being rather rare. Whether it represented originally interlaminations in the mullock or was formed in veins is uncertain, but a kind of banded structure in the line of dip of the reefs speaks in favour of the latter. These reefs vary in thickness from less than 1 ft. to over 6 ft.; they strike in all directions across the country, but are only of short extent, and differ very much both in direction and angle of underlay—the latter ranging from vertical to less than 20°. Some of the reefs shows also much irregularity in their course, for they expand and contract, twist and curve in strike and dip in quite a peculiar manner, and are—what is the case also with most of the others—frequently faulted by slides and cross-courses, so that it requires very great attention and perseverance on the part of the mining managers not to lose them. Considering all these points in connection with the fact that the country—rather soft phyllite—is also very much disturbed both in strike and dip—steep and flat dips alternating and changing in direction within short distances—it appears next to certain that not only the peculiar soft and gravelly nature of the reefs, but also the exceptionally flat dips of some are not original, but due to strong pressure, friction, upheaval, &c., and as the cause of these disturbances appears the most likely the intrusion of the dark hornstone porphyry, which, as mentioned at another place, occurs in small knobs and dykes at several places on the range near Carricktown. Unfavourable as these features no doubt appear, touching straightforward and uninterrupted working of the reefs in future, he feels no apprehension of the latter giving out suddenly or at a limited depth, for they are in every respect true lodes, crossing the country both in strike and dip, and showing most frequently the hanging-wall, less frequently the footwall, and in some instances both walls well defined and separated from their mass by clayey casings, mostly polished and striated, representing the so-called "slickensides," which afford unmistakable proof of movements of the walls of the reefs.

The only reefs of the Arrow and Skipper's Creek groups in work, and of which we were able to examine the workings, are Southberg's and the Nugget and Cornish, Skipper's Creek; still, from examination of the outcrops of some reefs at Arrow, and information received about the character of a number of others once worked, but since abandoned, in both districts, he was enabled to form an opinion on the general character of the group. These reefs are true massive lodes, ranging from 4 to over 20 ft. in thickness, which cut through the country both in strike and dip—the latter being generally steep—and show more or less well-defined walls, with clay casings; a number are traceable for long distances—some for miles—in strike. In point of composition and structure they approach, however, far more mullock reefs than true quartz reefs—they represent, in fact, fissures partly filled with debris from the country, full of interlaminated quartz, partly occupied by bunches and veins, of variable size, of true reef quartz. The mullock seems in the larger reefs to be generally predominating, and forms in places where their width very much increases by far the greater part of their mass—in fact, experience tends to prove that the thicker a reef is, or the wider it becomes, the more mullock it contains, whilst on the contrary, decreasing thickness is connected with a relative increase in quartz, and the reefs become also better defined. The bunches and veins of reef quartz occur either on the hanging or foot walls, or on both walls, rarely in the centre. They appear to dip shoot-like in strike, and are generally payable or richly auriferous, but the somewhat mineralised mullock, with its interlaminations and fine cross veins of quartz, has, also, in all the reefs opened, been found to contain gold throughout, though generally only in payable quantity within the line of the quartz shoots, or where the reefs much contract in size. The yields have ranged from several pennyweights to over 4 ozs. of gold per ton, but average from the reefs at present worked about 10 to 16 dwt. per ton. Although none of the reefs at Skipper's Creek have as yet been opened below permanent water level, they are already highly charged—both quartz and mullock—with pyrites, which seriously interferes with the satisfactory saving of the generally fine gold during crushing.

The reefs of Macrae's Flat and Shag Valley are the least promising in the province, being mere interlaminations or layer lodes. The so-called Peninsula quartz reef at Portobello is not, in his opinion, a quartz reef at all, but impregnations of gold in a finely divided state through various kinds of rock. Three trials were made with rock from Messrs. Forbes and McAuley's ground—two of the hard rock of 1 ton and $\frac{1}{2}$ ton, which yielded respectively 8 dwt. and 11 dwt. of gold; and the third of 1 ton of the softer decomposed cap-rock, which gave, strangely enough, only 6 dwt. of gold, whilst generally decomposed portions of pyrites-bearing rocks are richer than undecomposed ones. All the recorded trial crushings were executed at a good battery in Victoria, and in order to remove further doubt about the genuineness of this strange auriferous character of the quartzose, white trachyte, and the rock from the shaft, several small samples were most carefully tried in Dunedin, and these all produced gold. Accepting the auriferous character of the rocks, therefore, as satisfactorily proved, and considering that between the places opened there exist virtually not a feature such as would indicate a narrow auriferous zone or streak in their line down the mountain side, whilst it would seem very improbable that just per accident the auriferous portions of the rocks were opened and exhausted, we must come to the conclusion that there is a great likelihood of the gold being generally disseminated—richer and poorer in places—through these peculiar varieties of rock as far as they extend. As the matters stands, the average results of the washings from Nos. 2 and 4 workings are certainly such that, taking into account the facilities the ground offers for mining, abundance of timber close to, &c., they should render working on a large scale, with ample crushing machinery near at hand, highly payable. Considering this, it would be really deplorable if the still lingering doubts in the reliability of the results of the trials made—i.e., whether the gold really came out of the stuff and not out of the crushing machine—were not definitely set at rest by a further and more extensive trial (say) of 10 to 15 tons from each of the two good places. Strange as the occurrence of gold in such matrix, and under such circumstances, no doubt appear, it is in reality not without its alliances—at least, in certain respects—both in another part of New Zealand and in foreign countries. Capt. Hatton, who is intimately acquainted with the Thames gold fields, North Island, recognised once a certain resemblance between the geological features of the locality under notice and those of the Thames district. He thought the greyish white trachyte of the former looked much like the gold-bearing trachyte-tuffs of the Thames, though there, as well-known, the gold is found in bunches and veins of genuine quartz, and does not occur finely disseminated through the mass of the rock. The hard crystalline rock of No. 4 workings he also considered similar to rock of which dykes traverse the auriferous tuffa of the Thames, but which itself has not been found auriferous. Altogether there exists, besides what we already know of their auriferous character as such, the chance that any quartz reefs or veins found traversing the trachyte and trachyte-greenstone in the locality under notice, or in fact wherever they occur, may prove highly auriferous, and on this account not only the neighbourhood of the workings, but the whole of that part of the Peninsula is well worth a thorough prospecting. The shore line showing the rocks generally plainly exposed offering in this respect special advantages.

Of copper ore two occurrences were mentioned to Mr. Ulrich as worth inspection at Waipori and Moke Creek, but as the workings, having been for years neglected, were inaccessible, he did not visit the places. According to Mr. Hill, the manager of the O. P. Q. Company, a large patch of cupiferous gossan was observed in the bed of Reidy Creek, at a point about five miles south-west of Drummond's station. On working this patch it led to a vein of yellow ore, 1 to 2 in. thick, running with the creek east and west, and dipping north at 1 ft. in 8 ft. The prospectors sunk a hole to the north in the creek bank about 20 ft. deep, when they struck the ore vein on the underlie 12 in. thick, and showing fine smooth walls. A flood soon after covered the workings in the creek several feet deep with mud, whilst the shaft fell in, and the place has not been touched since.

but there is still a lot of the broken ore lying about on the creek bank. Assays of it have produced from 8 to 24 per cent. of copper. With regard to the nature of the vein ore, it consists of an intimate mixture of iron and copper pyrites, and would as such prove very variable in its percentage of copper. The rock in which it occurs is phyllite. At Moke Creek Mr. D. MacKellar could only find in the line of the old workings, situated close to the creek, thin seams of malachite and yellow ore interlaminated, and small particles impregnated in mica schist, which forms the rock formation of the locality. On the opposite side of the creek a more lode-like looking formation, 1 to 1½ ft. thick, of gossan ore, crops out just a foot or two above the level of the water, dipping apparently downward in strike; the latter being N.W. and S.E., and the dip slightly S.W. Pieces of native copper, several ounces in weight, have been found in the creek below the place. According to Mr. Bradshaw, of Dunedin, the old workings followed a lode of solid yellow ore 3 to 5 ft. thick, of which assays by Dr. Hector and himself gave 22 to 24 per cent. of copper, whilst Mr. Hackett, who examined the lode on behalf of the Government, estimated it at 12 per cent. on the average. This ore, of which I saw a large lump in Mr. Bradshaw's office, is also like that of Waipori—an intimate mixture of iron and copper pyrites, and contains likewise some gold. Antimony and cinnabar have been found in the Province, but they do not appear to be worth working.

In consideration of the high value of the occurrence of brown coal was for the province, Mr. Ulrich visited several of the mines within easy reach during his journey. Shag Point Coal Mine, situated within a few chains from the sea shore, is on a fine seam of first-class pitch coal (the best kind of brown coal) 7 ft. to 10 ft. in places 12 ft. thick, which dips north-east at the rate of 1 in 10 towards the sea, and rises into the Shag Point hills at the back—the field available for working being indeed very large. It has been opened, and is being worked by a fine adit, and the system of exploitation adopted is by post and stall, the stalls being taken 14 to 16 ft. wide, whilst the pillars left between are only 7 or 8 ft., a thickness which appears to him rather small to insure the safety of the mine; for there is the danger of the front pillars being crushed long before the stalls have been wrought to the farthest end of the field. Below this fine seam, with stratum of 4 ft. of shale between, there is another seam of similar good coal about 4 ft. thick, which has not as yet been worked. Walking along the beach this lower seam can be traced for a considerable distance to a point close to the mouth of the Shag river, where it disappears towards the sea in consequence of a roll or saddle in the strata, well exposed in the cliff, changing the dip to west 25° north at angles varying from 25° to 45°. Round the cliff, up the Shag river, which runs close at foot, a series of six seams crops out through a distance of five or six chains, and there may be several more higher up the valley towards Mount Puke Ivti. Some of these seams are several feet in width, and their basset edges can clearly be seen across the river, disappearing underneath the sand hills of the flat beyond, their dip being at an angle of about 35° seaward. As there is a considerable breadth of ground between the shore line and the line of strike of the seams from the river across the flat, there is no doubt some chance of a certain extent of the seams existing, and being workable in the lower end of the flat above high-water mark. All depends greatly upon the depth of the valley, and the thickness of the overlying sand and drift deposits respectively. If these latter are very shallow throughout, the coal ought to exist underneath the whole of the above area; whilst, on the contrary, if their thickness is very great, there is little or no chance for it at all, for in that case the slope of the valley formed of the coal rocks would be correspondingly steep, and the seams would run down it towards the sea, probably without curving round into the flat, outside high-water mark. Mr. Rich, the enterprising proprietor of Bushy Park, who kindly conducted me over the ground, told me he intended to risk some money in prospecting for the seams in the flat by sinking and boring; and he may by this time have already solved the question as to their existence at a spot we agreed upon as the most suitable to commence operations. Whether the seams, if found, would pay to work is a rather doubtful point, however, considering the large quantity of water that may be likely to exist in that part of the valley, representing, as it does, the embouchure of a pretty large river.

The Real Mackay Coal Mine, Tokomairiro, is opened upon a splendid seam of pitch coal, about 21 ft. in thickness, of nearly as good a quality as that of Shag Point Mine. It (the seam) is solid and pure throughout, as far as exposed—distance of about 2½ chains—and dips at an angle of 4.5° towards W. 20° N. The workings, consisting of an irregular quarry, are situated on the side of a low flat topped hill, dividing two gullies, and of which the seam no doubt forms the base throughout, being overlaid by an increasing thickness of sand and fine clayey gravel. But even right on top of the hill this overburden would probably not exceed 20 ft. in depth; at present it amounts to about 10 ft. The quantity of coal available for remarkably easy access is extraordinary, and if working were carried on more systematically the working expenses per ton might be reduced to, perhaps, less than half of what they are at present. For instance, instead of throwing the overburden down the face on to the floor of the seam, and moving it from there once and twice over, as I saw being done, tramway ought to be constructed from the top of the seam into the gully close in front, on which it could be at once trucked out of the way. In the breaking of the coal more care should be exercised, in order to produce a less quantity of smalls than at present, and a more advantageous method of working would be by side stops, similar to the long wall system, with small tramroads leading from the stops to filling places for carts, &c. As far as observable the seam extends into the hills all around the mine, but apparently becomes thinner and dips steeper the further away from the latter. At one place, some 5 chains eastward, it has been sunk upon, and found only about 12 ft. thick, but of fine quality, with thin seams of jet running through it, whilst some 16 chains to the N.E. where it is plainly exposed up the side of a hill, it is reduced to about 6 ft. quality unaltered. A local company is here opening it, at a spot well chosen near the foot of the hill, by an adit at present 40 ft. in length, and with the object of working the seam in the proper manner up its dip. But they had already worked out an apparently large portion of the seam in a very disadvantageous way down its dip, and at an unsuitable place some distance up, and in a sharp depression of the hill, for every bucket of coal, and, probably, also of water, collected under foot had here to be raised up the incline, and the coal carted down the hill to the point where the seam is now being—and should originally have been—opened. There are several other places on the flanks of the surrounding hills where coal has been prospected and slightly worked; whether these are on the seam just noticed or on different seams requires yet to be determined. Considering the extent, easy accessibility, and quality of the coal already disclosed, irrespective of the chance of other seams existing, its neighbourhood to the railway, &c., this locality may likely become one of the most important sources of supply of fuel for the province.

The Lawrence Brown Coal Mine lies about ½ mile west of south from the town of the same name, and the deposit—an earthy brown coal—seems to occupy a small trough or basin. For where opened its dip is a few degrees south of east at an angle of 15° to 20°; but another outcrop, about ½ mile beyond, on much higher ground, dips in the reverse direction, thus proving a fall from both sides towards the centre. It was first opened by an incline, but is now worked by a fine roomy shaft and horse-whim. Its thickness is at present 17 ft., and seems to increase towards the centre of the basin, but only 10 to 12 ft. of the bottom part are taken, in order to secure a good roof of the remainder, very little timber being in this way required for support. Although the coal, as an earthy kind, is of but a middling quality, being laminated, and falling easily to pieces on exposure to the atmosphere, still as it burns very fairly, giving out a good heat, it is of high importance to the district, and duly appreciated for household and other purposes. In some places in the deposit it is rich in resin, and its quality seems much to improve towards the centre of the basin. Judging from its general character, he thinks this coal would be well suited of being compressed into briquettes. The deposit is overlaid by a stratum of fine fire-clay, which is manufactured into first-class bricks at the mine. There

are several more deposits of brown coal of generally good average quality worked higher up the country—for instance, between Roxburgh and Alexandra, at the foot of the Carrick Range, between Cromwell and Arrow, in the valley of the Kawarau, &c. These he had no time to visit, and can only say that lying as they do within districts entirely bare of timber for fuel, their occurrence proves an inestimable boon to the inhabitants.

NOTES ON FOREIGN MINING LAW.

No. IV.—PROPOSED NEW LAW FOR SWEDEN.

A draft of a new mining law for Sweden, made by a Committee appointed for the purpose, has lately been published, and is now under discussion, in that country, where it has not been very favourably received. As any change will doubtless affect English interests, the following abstract of this new project of law will be interesting to many of our readers.

The proposed law, which is intended to be a complete mining code, is comprised in 191 paragraphs, arranged in 11 chapters, and is marked by the brevity and clearness which characterize Swedish statutes in general.

The first chapter relates to the obtaining of a mining concession, without which no mining can lawfully be carried on, unless in the case of the so-called odal mining fields, in which mining has been carried on from time immemorial. The subjects of a mining concession are as follows:—gold, silver, platinum, mercury, lead, copper, iron, manganese, chromium, cobalt, nickel, zinc, tin, titanium, bismuth, antimony, arsenic, and sulphur, and their ores, together with graphite and coal. Lake ore is included, but not bog ore. In order to obtain a concession a written application must be made to the mining superintendent of the district, in which are specified the name, residence, and occupation of the applicant, the nature of the mineral discovery, its exact locality, and the position of the central point of the field in which the applicant wishes to carry on mining. The applicant has also to propose a name for the concession, and to set up a mark on the ground at the central point, which remains there until the boundaries of the concession are determined. The applicant is also required to adduce proof that, so far as it is known, the central point is not situated within any other concession, or nearer to the central point of another concession than 1700 ft. if the mineral is coal, or 570 ft. in other cases. The mining superintendent must pronounce a decision on every application made to him for a concession within 30 days. If the applicant has not fully complied with the requirements of the law he is allowed 60 days to amend his application. If no obstacle arises the mining superintendent issues the concession, or license, to mine (*mut-sedel*), which contains permission to the holder and his assignees, in the absence of a better right belonging to another, and subject to the requirements of the law, to work the mineral discovery, the nature and position of which is described in detail, the name by which the concession is to be distinguished, the date when the application was received, and a direction that the concession be published by being read in the church of the parish in which the mineral discovery is situated within 60 days after the issue of the concession. In a concession granted to a foreigner it must be stated that his right to carry on mining is dependent on the permission of the King, and that such permission must be applied for within 90 days after the issue of the concession. If several applications are made on the same day the first discoverer has the preference. A mineral discovery which has been the subject of a concession which has lapsed or been forfeited may be the subject of a second concession, but not until the first has been declared invalid by a judicial process. In such a case the previous holder cannot obtain a new concession, the owner of the ground having a preference over every other person, unless he happened to be the holder of the lapsed concession, or a share of it. The validity of a concession may be challenged until the boundaries of it are fixed, with proper formalities, but not afterwards. If an application for a concession is refused the applicant may appeal to the supreme mining authorities (*bergs over styrelsen*) within 60 days after the decision of the mining superintendent was given.

The second chapter contains the provisions relating to exploration. The holder of a concession has a right to make the explorations which are necessary before the boundary of the concession can be fixed, and to use or make a road to the place. He must give the owner and occupier of the ground a certified copy of the concession, security for the compensation to which they are entitled, and a statement in writing of the place where the work is to be carried on, 14 days before a commencement is made, at the peril of the concession being declared invalid if complaint be made within the time fixed by law. A concessionaire is entitled to occupy as much of the surface as is required for the necessary constructions (exclusive of dwelling-houses) and for depositing the ore and waste taken out of the mine within a distance of 1200 ft. from the central point in the case of coal mines, and of 400 ft. in other cases, exclusive, however, of any ground within 1700 ft. in the case of coal mines, and 570 ft. in other cases, from the central point of an older concession, of ground set apart for public use as roads, railways, canals, churchyards, and burying places, or where the mining may cause damage to any public building or construction—of ground at a less distance than 600 ft. from a dwelling-house or out-building connected with it from a garden or enclosed park, without the permission of the owner and occupier, unless the house has been built or the garden or park laid out after a copy of the concession was given to the owner of the ground. It is permissible to make use of old mine openings at a less distance than 600 ft. from a house. The owner of the ground is entitled to a yearly payment in advance for the use of the ground, and if the undertaking is abandoned before the boundaries of the concession are determined he has a claim on the concessionaire for any deterioration in the value of the ground by mining operations. The employer is also liable for any damage that may be occasioned by his operations. The opening of the mine must be enclosed, and if it is abandoned it must be surrounded with a stone wall. The mineral won in the course of the exploration belongs to the explorer if it is of the kind mentioned in the concession, or if though not of that kind it is found advantageous to mine it along with the other. Also if it is found advantageous in the course of exploration to mine along with that which is the subject of the concession another mineral which cannot be the subject of a concession (as fire-clay in coal mines) the concessionaire may make use of whatever is required for the carrying on of the mining without payment; the rest he must offer to the owner of the ground at the cost of mining and raising. If the ground owner does not claim it within 30 days after it has been offered to him it reverts to the concessionaire.

The fixing of the boundaries of concessions (called in Swedish *Utmol*) is the subject of the third chapter. The boundary of a concession must be determined within four years in the case of mines, and two years in the case of lake ore, from the day when it was issued. It may be done on the application either of the concessionaire or the ground owner. The exploration should be so far advanced that the position, direction, and extent of the ore deposit may be judged with reasonable certainty. The holder of a single concession is entitled to have assigned to him an area of a square with a side of at most 2400 ft. in the case of coal mines, and of 800 ft. in other cases, with the central point indicated in the concession in the middle. The form of the area assigned may, however, be altered according to circumstances, but the central point must in any case be included within it; its length must not exceed double its breadth, and curves and acute angles must be avoided. The boundaries of the concession are in future to be perpendicular to the surface, unless in cases where this is rendered impossible by the neighbourhood of an old concession. Within the assigned area the concessionaire is entitled to acquire by compulsory purchase whatever ground is required for carrying on the mining, and beyond the area he is also entitled to acquire in the same way not only whatever ground is required for roads, but also space for such machinery as is driven by water, and may be advantageously used for working the mine. In cases where the value of land owned by an individual would be much diminished by such a forced sale, he may

require the concessionaire to take the whole. The concessionaire has no right to erect a dwelling-house on the assigned area. He must pay for the ground taken over by him at the highest rates current for such ground in the neighbourhood, as well as give compensation for deterioration in value in other ground, and in fisheries by his operations, as the drying up of wells, the loss of amenity, a concession is an official act of the mining superintendent of the district, or his substitute, appointed for the occasion by the supreme mining authorities, all parties interested being duly summoned. The mining superintendent, or his substitute, decides all questions relating to the form and extent of the boundaries, but in fixing the amount of compensation for damages, and the price of the ground given up by the owner to the concessionaire, he is assisted by three persons, who are commissioners for dividing estates among heirs, according to the Swedish law, or jurymen (in both cases periodically chosen by popular election). The fixing of the *Utmol*, or boundary of a concession, is a public act, performed on the spot, which proceeds without interruption until it is finished, in the absence of any of the parties interested, except the applicant or his attorney. A protocol, or narrative of the proceedings, is drawn up by the mining superintendent, or his substitute presiding, to which is appended a plan of the ground on which the boundaries of the concession are delineated, and a certified copy of this completes the title of the concessionaire. If the price and compensation assessed be not paid within 30 days, with interest from the date of the fixing of the *Utmol*, the mining may be stopped by application to a magistrate. If payment be not completed within 30 days after mining is thus stopped the concession is forfeited. If a concession is forfeited, or abandoned, the ground reverts to the former owner without payment. The owner of the mine is allowed two years after the forfeiture or abandonment of a mine to carry away any mineral won by him, after the lapse of which period it becomes the property of the owner of the ground, unless in the interval a new concession of the mine has been granted to another party, when it falls to the new concessionaire. The costs of the process of fixing the *Utmol* fall on the party to whom it has been assigned; if none has been assigned they fall upon the party applying for it. If it has been assigned the concessionaire is entitled to immediate possession, any appeal to a higher authority notwithstanding. The holder of a concession may lawfully win not only the mineral specified in his *Utmol* which may be the subject of a concession.

THE GOLD FIELDS OF YESSO—No. II.

The Upper Toshibetsu gravel yielded on the average 136 millimetres per cubic metre. An average collection of pebbles of medium size taken at random gave—quartz, 34 per cent.; quartz and metamorphic sandstone, 19; gneiss and granite, 29; micaschist, 4; talcose schist, 3; and chlorite schist, 11 per cent. Mr. Kitagaki, who visited this field in 1872 in company with Admiral Enomoto, saw a sample of the gravel farther down with similar results. At Akabuchi 3 cubic metres of gravel yielded 3428 millimetres of gold, or at the rate of 114.3 per cubic metre. About 11 years ago Sanjemon, the gold washer employed by the party, worked in the same place for the Government of the Shogun, having five or six men as assistants. The work was continued about 2½ years, in which time about 250 momme of gold (932 grammes) were obtained from a limited area. While working actively the yield was at the rate of 2½ momme per month for each man employed, worth, perhaps, 5½ yen. Much time, however, was necessarily lost in unprofitable work, cutting ditches, &c. On the Kuusube the yield per man was about the same as on the Akabuchi. The blue gravel of the highest terrace could not be perfectly tested, but seems to give an average of 50 millimetres or less to the cubic metre. At Okajisawa the average was 68 millimetres to the cubic metre, and at Ponkajisawa one cubic metre yielded but 30.8 millimetres of gold in exceedingly fine grains. At Chingcombe the cubic metre of gravel and at Nishemubetsu only one-tenth of a milligramme to the cubic metre. Estimating the area of the terraces, Prof. Munroe states that if the upper valley alone were washed 2,400,000 cubic metres of gravel would be available, which at 7½ cents per cubic metre would give a gross yield of gold worth 180,000 yen. To extract this amount of gold would cost (say) 100,000 yen, and leave about 80,000 yen to be obtained in five to ten weeks' work, depending on the number of men employed.

The Kudo gold field yields on the Moshibetsu only 7 mm. per cubic metre, and on the Usabetsu 1 mm. per cubic metre. While examining these gold deposits Prof. Munroe's attention was called to some thin beds of coal which occur in the shales at the upper end of the valley of the Moshibetsu. There is 1 ft. of coal divided into three strata separated by clays. This deposit of coal is so thin and bad as to be quite worthless, but the fact that the strike of the rocks is the same as that of the coal rocks of the Kayanoma field is not without interest. There is a vein of quartz holding blonde, copper pyrite, and erubescite in the small valley of the Yunosawa, but it is not worth working. While in Kudo they learned that gold had been found in several of the valleys near Esashi, but upon examination it was found that the gravel of this gold field proves to be exceedingly poor, far too poor to be worked, not only in the unfavourable cases where it was found impossible to reach the bed-rock, but even under advantageous conditions as on the Jimikishi. The best samples gave but 20 mm. to the cubic metre. While at Esashi they were informed of gold fields then being worked in the vicinity of Matsumai said to be quite rich, but as the lead mines at Yurap were still to be surveyed the examination was deferred. The following season Prof. Munroe was ordered to proceed to Matsumai, and to test the richness of the gold fields in that vicinity, visiting at the same time any useful minerals to which his attention should be called by the Japanese officials of the province. In the immediate vicinity of Matsumai there are a number of gold fields of small extent, from which it is said large amounts of gold have been taken by gold washers from the south some 600 or 700 years ago. These fields were visited, but found to be entirely exhausted.

On reaching Fukuyama, the town of Matsumai, they found the gold washers to whom they had been directed from Hakodate, and learned that this Musa Valley was the gold field referred to. After spending a few days at Fukuyama they returned to the Musa, making their head-quarters Ichinowatari. His attention was called to some veins of lead ore at Akagami, but he found them neither large enough nor sufficiently numerous to pay for working. Their chief interest lies in their resemblance on a small scale to the lead-bearing veins at Yurap, and to similar deposits now worked at Daira, in Akita Ken, on the main island. While in Fukuyama a specimen of lead, worth 6½ per cent. silver, said to have been derived from the smelting of a newly-discovered silver ore, was brought to his hotel. The ore was a partially discomposed silty rock containing no silver, and the lead said to have been added in smelting had only a small fraction of 1 per cent. of the precious metal, so that the button had evidently been salted.

The Musa gold field, in the province of Oshima, appears to have been very carefully prospected. The value of the gravel decreases from the upper end of the valley down stream, those from the head of the valley being richest (omitting exceptional result, 146 mm. to the cubic metre, obtained at Yunoshiri), and those nearest the sea the poorest. The results show that neither the whole field nor any part of it can ever be worked with profit at the present prices of labour. There is evidently a small area of ground near Yunoshiri, possibly as much as 1000 square metres, though probably much less, which will yield 8½ cents per cubic metre; but there is no water convenient, and the gravel might have to be carried on pack-horses or by carts to the stream below. It certainly would not be advisable to bring water by a ditch to this point, as the area of rich ground is too small to warrant such expense. The Tokachi gold field is extremely poor throughout the best trial, that at Shimichikayope yielding but one farthing's worth of gold per cubic metre, and most of the rock yielding but one-fiftieth of that quantity. As to the general prospects of gold mining in the districts reported upon, they would appear to be not very encouraging, but the Japanese

may be congratulated that the exploration has been so carefully carried on by Prof. Munroe that the localities most worthy of attention can be readily determined, and disappointment reduced to the minimum.

IRON TRADE IN GERMANY.—An important general meeting of the members of the German Iron and Steel Association was held at Berlin on the 11th inst. Representatives were present from all the groups in the north-west, east, centre, north, and south of Germany, from the newly-formed association in the south-west, and from the mines and works in Alsace-Lorraine. The principal business of the meeting was the sanctioning of a memorial to the several German Governments, embodying an account of the present condition of the iron and cognate industries in Germany, and petitioning for the postponement of the abolition of the import duties on finished and unfinished iron manufactures, which abolition is to take place on Jan. 1, 1877, according to a decision of the Reichstag in the Session of 1873. The memorial (says a correspondent of the *Cologne Gazette*, after describing the present position of affairs), deals with exhaustive statistics showing the price, &c., in different departments of production, the decline of business, the numerous stoppages of works, and the import and export conditions of the past three years. It contains also comparative tables showing the duties in different countries, and the relative development of production, and concludes with an account of the technical difficulties encountered by German manufacturers, and the consequences of the advance of the railway tariffs. The meeting refused by an overwhelming majority to support any agitation for the imposition of new duties, but adopted the representation that the several Governments and the Reichstag should take into consideration the present difficult position of the trade, and retard the removal of those duties now in existence. Several speakers urged that the more the petitioners moderated their demands, basing them solely upon the present condition of affairs, without calling into question general economical principles, the more probable would be their success. It was eventually decided that the petition should be dispatched to the various Governments.

NEW GUINEA.—The impending annexation of New Guinea to the dominions of the British Crown causes much interest to attach to the scientific expedition, equipped at his own cost, just undertaken by Mr. WILLIAM MACLEAY, F.L.S. This magnificent island forms one of the few large spaces of *terra incognita* now remaining on the surface of the globe. It has for some time attracted great interest in the one side from men of science anxious to know more about its mysterious interior, its mountains, large rivers, rich vegetable productions, animal life, and mineral products; and on the other from Australian politicians and the Australian people, who are anxious to see this island taken possession of by Great Britain, by that means preventing any other power from forming a settlement at our doors. Just at the precise moment suitable for advancing the one object and the other, Mr. W. Macleay announced his intention of fitting out an expeditionary vessel and proceeding to New Guinea, or the purpose of making a scientific exploration. In a speech he made at a picnic given to him by the Linnaean Society of New South Wales, of which he is president, Mr. Macleay fully explained the object of his undertaking. He had resolved to spare no expense to make the expedition a successful one. If the natives at any of the points at which he may touch manifest a determined hostility to their landing and intercourse with them, he will not, in the interest of humanity, endeavour to force his way. But collisions with savages are not unfrequently brought about by the mistake of civilised visitors, or of those who are presumed to be civilised. Whatever may be in a scientific point of view the results of his exploration, they shall reveal, no matter from what distance he may be compelled to draw the delineation of the various departments of science, their illustration in Australia, where I propose to publish the results of his voyage. He will be accompanied by highly capable men of science, and trusts that his voyage may not be a long one—a pause of meeting them all again under circumstances as pleasant as these. Mr. Macleay's ship is a fine French-built vessel of 314 tons register, originally built for the French Navy at Rochefort in 1860, and a model of the old school, having great beam at rise of floor. In the service she once carried 14 guns, of 1 ton each, and is apparently a strong and handsome vessel—on that will stay well and be weatherly. She is under the immediate command of Capt. Charles Edwards, having 15 years' experience in the island trade in the Pacific, and the ship's company consists of 1 master, two mates, an engineer, a carpenter, three steersmen, cook, three able seamen, eight kanakas (from Rotuman), a lad, and Dr. James, the surgeon. Besides the foregoing, the following persons will sail in the Cheveret expedition—A. W. Macleay, Capt. Onslow, R.N.; Mr. Masters and Mr. Brazier, naturalists; Mr. Pettard, a Spaniard, zoological collector; and taxidermists; and Mr. Beding and Mr. Dingwall, botanical collectors—in all 30 souls. The two botanical collectors are sent by Sir William Macarthur, but all the rest of the scientific staff are at the sole charge of Mr. Macleay, by whom the expedition has been fitted out. The Cheveret is well supplied with every necessary store and special appliance for her voyage. There is a neat little armament in the after cabin, well supplied with six rifles, breech-loading revolvers, and such like weapons—should such means of defence be necessary. She also carries two handsome broadsides six pounds on deck, and a large number of rockets and harpoon guns. The provision made for collecting biological and botanical specimens is ample and satisfactory. Two hundred and fifty gallons of spruce wine have been put on board for preserving zoological specimens, and the naturalists will also find themselves well provided with nets and contrivances for fishing—such as seine and trawl nets, and implements for gleaning, &c. The expedition vessel sailed on May 18, when a large party of gentlemen, on the invitation of the Ministry, assembled on board the Coonanbara, at Circular Quay, to accompany Mr. William Macleay down the harbour. The party consisted of upwards of 200 persons—the Ministry, members of both Houses of Parliament, Government officials, gentlemen taking a leading part in mercantile maritime affairs, and other influential residents of the city. A considerable number of gentlemen afterwards came on board the Coonanbara when she was lying off Elizabeth Bay, to which spot the steamer at once proceeded on leaving. It was a calm and lovely morning, such as was but very rarely seen before the commencement of Mr. Macleay's expedition, to which so much public attention has of late been drawn. As the steamer Coonanbara swept out of the cove and thence out to sea. Shortly before 11 the two small steam barges belonging to the Government left the Coonanbara, and went up the Bay to the Cheveret, whence they shortly afterwards returned to the steamer with Mr. Macleay, his father-in-law (Sir Edward Deas Thomson, C.B., K.C.M.G.), Captain Onslow, R.N., Mr. Masters, Mr. Brazier, and some others. When Mr. Macleay and his friends were seen coming down to the Coonanbara they were loudly cheered, and as soon as the leader of the expedition and Captain Onslow stepped on deck, they were at once surrounded by a crowd of enthusiastic friends. A lunch was given to Mr. Macleay on board the Coonanbara, and soon after the adieux were said between the excursionists and the members of the expedition. With many a warm shake of the hand and parting word Mr. Macleay and Captain Onslow at length went down over the side of the Coonanbara into the steam barge, and were taken on board the Cheveret, amid the vociferous cheers of those remaining on the large steamer. The hand played appropriate airs, and the Coonanbara moved twice round the Cheveret, at first showing the signal of "Wish you a pleasant voyage," and lastly the inevitable sad word, "Farewell." The Coonanbara then turned her head towards Sydney, while the Cheveret, following the Thetis, shortly before 3 o'clock passed through the Heads, and with a fair wind proceeded on her voyage.—(*The Australian Sketcher* of June 12.)

ST. JUST AMALGAMATED.—At the auction held at the St. Just Amalgamated Mine, under the directions of the official liquidator appointed by the Stannary Court, for disposing of the leases of the mines and the materials, in one lot every information respecting the condition of the mine was afforded by Capt. Pryor, the late manager of the company. The highest offer obtained was £1500, which, not being so high as the valuation made for the Court, the lot was withdrawn, but the reserve price was not mentioned. The liquidator gave orders to at once commence pulling up the pitwork. It seems a very great pity that such a promising mine should be abandoned. The fault, however, must not be laid against the company, as they used every endeavour to obtain permission from the lords to break through the boundary line existing between the St. Just and the Cape Cornwall Mines. Both of these mines are on the same lode, and the best of the tin ground in the St. Just part reaches as far towards Cape Cornwall as their boundary, where it enters another lord's land. The penalty for breaking this line is not known, but it is said to be £1000 per month. The liquidator gave orders to the miners to remove the lode to obtain permission to work the mine.

THE CHINA-CLAY TRADE.—This trade is again a shade better, and the best quality clay realises full prices. The cost of raising china-clay varies very much according to circumstances, but the Cornwall Minerals Railway has so "tapped" the whole of the St. Austell district, that the facilities for carriage are greatly increased. A concern started some few years ago with a capital of £3000, has done wonderfully well. Perhaps the cost of raising, dressing, and making clay marketable would not exceed from £6. to 7s. per ton, to which add from 3s. 2d. to 4s. 6d. per ton for carriage to the port and free on board—say, cost in all without lord's dues £9. 9d. to £11. 6d. To this add for dues 3s. to 3s. 6d. per ton, and a total cost will be arrived at from £12. 9d. to £14. 6d. per ton, according to circumstances. This clay is marketable at from 20s. to 25s. per ton, so that there is a good margin for profit.

THE TIN STANDARDS.—The standards for the ores were advanced on Tuesday 28. per cwt., and are now—Superior common, 76s.; superior fine, 77s. These quotations are about 4s. per cwt. below the last official figures. The smelters' quotations for the metal to real buyers are as follows:—Common, 83s. to 84s.; margin, 8s. 6d.; refined, 85s. to 86s.; margin, 8s. Current prices—Barca, 83s. to 84s.; Straits, 75s.

COAST MINE SHARE MARKET.—The Share Market has continued steady throughout the week, and prices generally remain firm. The tin market has also remained steady. Copper is keeping firm, and more attention is being paid to the production of this metal. Operations have been begun at Pendarves United by Capt. Joseph Vivian, who intends, we believe, working it for copper ore, a branch somewhat neglected under the late management. The following are the closing prices:—Cook's Kitchen shares are in more demand, and have advanced to 4s. 5d. The meeting will be held on Thursday, Aug. 26, when, however, another call will be made. The mine is said to be looking well. Carn Brea, 35 to 37, steady. Dolcoath moderately dealt in, and keep firm at 39s. 1d. to 40s. East Pools a little deal in at 13s. 1d. to 13s. 2d. East Lovells quoted 6 to 7. South Carn Brea dull at 25 to 30. Condurrow, 4s. 2d. to 4s. 5d. and a little more enquired for. South Crofty, 15 to 16. Tinroft, 19 to 21. West Bassett, 4 to 4s. 5d. West Frances, 6 to 6s.; West Tolgus,

46 to 48; Wheal Kitty, 2s. 1d. to 3s. Wheal Uny, 1s. 1d. to 2s. Wheal Jane, 3 to 3s. North Busy, 7 to 8; West Poldice, 4 to 5. South Frances offered at 1 to 1s. 1d. all calls paid.—*West Briton*.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received Aug. 2, 1875, per Minho (s.), dated Morro Velho, June 29:—

GOLD EXTRACTED TO DATE.—The produce extracted during the second division of June, being a period of 11 days, amounts to 16,262.3 ozts. It has been derived as follows:—

From mineral stamped	Ozs. Tons.	Ozs. per ton.
Re-treatment	14,810.9 from 1513 =	9.78s
	1,452.3 "	= 9.95s

Total	16,262.3 "	1513 = 10.747
	Ozs. Ozs. troy. Ozs. Ozs. troy per ton.	

Or 16,262.3 — 1874.7784 =	10.747 = 1.2391
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Morro Velho, July 1.—Measurements of the excavation as taken to date:—

	Fms. fms. in.	in.
The sump has been sunk vertically	1 1	10
From mark to bottom of sump	0	0
45. From bottom of sump to end of ground east	2	3 0
58. From bottom of sump to top of first stope west	2	4 5
13. From top of first stope to top of second stope west	8	5 5
17. From top of second stope to top of third stope west	13	0 7
52. From top of third stope to top of fourth stope west	8	5 0
45. From top of fourth stope to top of fifth stope west	2	3 0
19. From top of fifth stope to top of sixth stope west	10	4 8
70. From top of sixth stope to top of seventh stope west	9	5 8
32. From top of seventh stope to bottom of driving	5	4 3
Width of lode in sump	4	0

The driving under the roof has been under suspension during June.

Advices received Aug. 19, 1875, per Boyne (s.), dated Morro Velho, July 17:—

GENERAL OPERATIONS.—These have been carried on with regularity and dispatch both in the mine and at surface. Few interruptions have taken place, and a fair amount of duty has been done, with results which I hope may be found satisfactory.

PRODUCE FOR JUNE.—The produce for the past month amounts to 47,175.3 ozts.

It has been derived as follows:—

From Mineral stamped	Ozs. Tons.	Ozs. per ton.
Re-treatment	43,156.8 from 4330 =	9.96s
	4,018.5 "	= 9.28s

Total	47,175.3 "	4330 = 10.994
	Ozs. troy. Ozs. troy per ton.	

Or 5438.5447 ozs. troy = 1,2660 oz. troy per ton.	
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The result of the treatment of the mineral and sand is 229 ozts. less in June than in the preceding month, but as this decrease is caused by a temporary supply of inferior mineral, which for a few weeks cannot be avoided, I trust it will not be considered altogether unsatisfactory.

MINE DEPARTMENT.—The attendance of native borers at the mine has, on the whole, been very good, and a fair quantity of stone has consequently been quarried and sent to the spelling-floors for reduction. Owing, however, to the operations now going on for the opening out and better working of the mine, the stone sent from the B shaft has not been so rich or so plentiful as could have been desired, but I hope shortly to be able to note a considerable improvement in each of these respects.

WATER SUPPLY.—This indispensable means of our water power continues to be brought on by the company's regas in a quantity sufficient for the various operations of the establishment. The heavy rainfall, and more especially the long continued soft falling showers we experienced during the last wet season, naturally lead us to expect a more plentiful and longer continued supply of water this dry season than usual. It is, nevertheless, very necessary that every precaution should be adopted to prevent waste when this eventually fails, and with that object the usual needful repairs to the various regas are being carefully attended to.

REDUCTION DEPARTMENT.—The duty done in this department throughout the month has been very good; 4330 tons of mineral have been reduced and treated; 4656 cubic feet of sand were passed through the amalgamation process, and it yielded at the rate of 10.132 ozts. of gold per cubic foot.

LYON STAMPS.—The work of putting up the western side of these stamps continues to make satisfactory progress. I hope to see it completed and the stamps at duty in a very few weeks.

COST AND PROFIT FOR JUNE.

The produce being	47,175.3 ozts.
Loss melting into bars	323.6 "

Cost, less sums receivable in reduction of the same	6,367 0 8
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Profit for June	£11,788 0 0
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GOLD EXTRACTED TO DATE.—The gold extracted during the first division of July, a period of 10 days, amounts to 16,972 ozts. It has been derived as follows:—

From mineral stamped	Ozs. Tons.	Ozs. per ton.
Re-treatment	15,725.5 from 1862 =	9.81s
	1249.5 "	= .77s

Total	16,972 "	1862 = 10.594
	Ozs. troy. Ozs. troy per ton.	

Or 1656.5954, or 1.2212	
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HEALTH OF THE ESTABLISHMENT.—The medical officer reports that the general health has greatly improved, and that measles, which has greatly affected so many of our young and adult blacks, is now so rapidly disappearing as to lead him to hope that we may soon be free from this mild, but troublesome, complaint.

The following telegrams have been received:—On July 26—"Produce ten days (first division of July) 16,750 ozts.; yield 10.5 ozs. per ton; profit for the month (July) 11,700." On July 31—"Produce eleven days (second division of July), 19,500 ozts.; yield, 10.5 ozs. per ton." On August 11—"Produce for the month (July) 52,500 ozts.; yield, 10.5 ozs. per ton."

SAN PEDRO (Chili).—The directors have received a telegram from their financial agent in Chili, announcing that the engine went to work on Aug. 7.

PORT PHILLIP AND COLONIAL GOLD.—Telegram, dated Melbourne, Aug. 16: Month ending Aug. 11, yield per ton, 6d.wts.; Western reef, 6 dwt.s 7 grs. per ton; Eastern reef, 12 dwt.s 8 grs. per ton. Lode widening to 20 ft. Remittance, 850.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada: Hall, London: Week's run, \$44,00, from 2½ furnaces; one relaid started to-day.

SIERRA BUTTES (Gold).—The following is the result of the working at the Sierra Buttes and Plumas Eureka Mines for July:—Sierra Buttes Mine: Receipts, \$31,183; total California expenses, including cost of mining and milling, \$21,875. Plumas Eureka Mine: Receipts, \$30,174; total California expenses, including cost of mining and milling, \$17,516. In addition to the foregoing yield from the mill 75 tons of sulphurates have been saved, which are valued at from \$90 to \$120 per ton, and are expected to yield 90 per cent. of the assay value.—[The reports of Mr. Johns are noticed in another column.]

EBERHARDT AND AURORA.—The advices of Capt. Drake explain the cause of the diminished number of tons worked during July—that the celebration of the Independence Day, July 4, caused the works to be closed from the 3rd until the 9th. The directors have received the 6000t. advised in Capt. Drake's telegram of the 12th inst.

CEDAR CREEK (Gold Mines and Water).—T. B. Ludlam, July 26: Yankee Claim: During the past week I was enabled to keep this claim washing most of the time during the 12 hours of the day, with a shift of men breaking boulders and blasting up ground sluices at night. As we can now control the water I think this is the most profitable way of working. We are washing now on bottom gravel, and if the clay and rocks above do not slide again we shall be enabled to continue washing gravel throughout this run. I hope that such may be the case, to off set last run, during which we washed off little else but clay and rocks.—Yankee Tunnel: The one shift of men worked six days last week, and advanced 2 ft. 5 inches.—Water Supply: I am drawing the Yankees head from the lakes, and there is but little natural water running in our ditch.—Repairs and Dead Work: I am doing nothing of the kind (excepting the Yankee Tunnel), but have reduced my force of employees to the lowest possible number.

INDEPENDENCE (Gold).—According to Captain Jenkins' report for the week ending July 23, the usual progress had been made during the week with the various cross-cuts, and the labour for the construction of the new mill was all delivered, the new powder and charcoal houses were built and ready for use.

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ROSEWALL HILL AND RANSOM UNITED.—Wm. Bugelhole, J. White, Aug. 18: The lode in the north carona, in the back of the 100, is 4½ ft. wide, worth 30/- per fathom. The 100 west, on St. Ives Consols Standard lode, is very hard and spare for driving, but is still worth 20/- per fathom. Nos. 2 and 3 crossings are worth 12/- per fathom.—Goole Pelias: The lode in the new flat rod shaft, sinking below the 35, is yielding some very good work for tin, and is looking very promising. The 35 east is worth 8/- per fathom, and the 35 west is worth 7/- per fathom. In the 25 east we have a large stream of water and a lode worth 6/- per fm. In the 25 west the lode is 15 in. wide, worth 6/- per fm.—North Lode: The 25 west is being pushed forward with all speed; the lode in the present end is yielding rich stones of tin, and likely to improve as we advance towards the old working to the west of us. At the present time we are exploring these workings at a shallow depth, and have great pleasure in stating that we have a capital lode.

SOUTH BWADRAGIN.—A. Francis, Aug. 18: The 12 driving east is in a lode all the width of the end (5 ft.), containing blonde and lead ore, with a large portion of carbonate of lime, and water issuing freely, and is altogether a most promising ore. The adit extending eastward is in a lode 3 ft. wide, a mixture of blonde and carbonate of lime. The engine-shaft is now down between 4 and 5 fms. under the 12, and will be continued to the 25 as fast as possible, where, judging from the indications seen at the 12, a good course of lead and blonde ore may be expected.

SOUTH CARN BREA.—Wm. Rich, Jas. Knotwell, Aug. 18: The ground in the 100 west is getting easier, and the lode looks promising to improve. The lode in the rise in the back of this level carries good stones of ore. The lode in the winze below the 160 is worth 6/- per fathom. The lode in the engine-shaft is worth 8/- per fathom. The 160 east is improving, and carries good stones of strong yellow copper ore. We have suspended the cross-cut north, below the 50. The engine is heavily loaded, and we think it best to disconnect the rods underground. The slope in the back of the 150, west of winze, is worth 15/- per fathom.

SOUTH CONDURROW.—W. Rich, H. Abraham, Aug. 17: The ground is easier for driving in the deep adit cross-cut north of junction shaft. We think

there are some 5 fathoms to get through the old run in the adit east of engine shaft on William's lode. The 30 west of Fraser's is yielding low quality tin-stone. The 50 east, on the West Basa lode, is unproductive. We have cleared the 60 north on the cross-course, and shall now drive north to intersect the great lode at the 50 by the cross-course. We have cut through the lode in the 6' east, and find it poor. The winze in the 60 west is worth 8/- per fathom. The lode in the 70 east is worth 10/- per fathom. The 70 west is worth 7/- per fathom. The 82 east is worth 12/- per fathom. The lode in the 92 west is worth 8/- per fathom, and has a very promising appearance. The 93 west is worth 9/- per fathom. The 93 east is worth 15/- per fathom.

SOUTH PRINCE PATRICK.—J. Jones, Aug. 19: Southern Shaft: We are now down 52 yards with this shaft, and to-day one of the men found an old drift at that depth westward, and went along with it from 15 to 20 yards, and succeeded in making his voice heard by the two men driving to meet him from the western shaft. I was at this latter part to-day, and find Parry's lode quite strong and promising here, and I hope we shall not be long before we shall be able to work it through this shaft.—Western Shaft: The ore in Parry's lode continues about the same as last reported. All surface work goes on satisfactorily.

SOUTH ROMAN GRAVELS.—John W. Powning, August 19; Shelfield: During the last three days the shaftmen have been timbering the shaft, which has become weak and heavy from the 30 to the joint referred to in former reports, which is evidently the bottom of the hard rider. Having made the ground secure, we have again started to sink, and are down 4 fms. 3 ft. below the 30. The engine works well, and keeps the water at 11 strokes per minute.

SOUTH TOLCARNE.—J. Vivian and Son, J. Paul, Aug. 18: The engine-shaft is now down to the 40, and after sinking about 2 ft. more for a fork we shall come to hand driving north and south. It is likely that there may be a lode very near the shaft, judging by the numerous branches in the shallow adit. To the north we know with more certainty the distance we have to drive to reach Fraser's lode, this lode having been already intersected at the deep adit and the 20, where it has a regular underlie towards the engine shaft, and can therefore, safely calculate on intersecting it in two months. The indications connected with this lode are so highly favourable at the 20, and in the 30 cross-cut now approaching it, that we feel confident that at the 40 we shall make a valuable discovery of copper ore on it.

In the 30 fm. level cross-cut, north of the engine-shaft, the rock has become very favourable for progress, and we are passing through a belt of country dipping north or towards the lode, which is yielding yellow, black, and grey copper ore, with some blonde. The cross-cut must now be within about 2½ fms. of the lode, and, therefore, we are almost certain of intersecting it within a month from our pay and setting on Saturday next. Judging from the presence of so much rich ore in the rock we have great confidence that we shall find the lode still richer in copper. In going below this level the lode will by its south underlie pass into and through the metalliferous strata, through which the cross-cut is now passing, and this circumstance points strongly to the probability that this lode will become increasingly productive in depth, and yield results at the 40, which will exceed those we anticipate soon to realise at the 30.

ST. PATRICK.—William Francis, Aug. 19: The cross-course in the 90 yards level still keeps open with the same kindly compounds of clays, gossans, &c., and beds of serpentine on the heading and hanging fully 3 ft. wide. The bottom cross-cut is progressing favourably in the white-bearing limestone.

TANKERVILLE.—A. Waters, Aug. 12: Watson's shaft, now 5½ fms. below the 160, and 193 fms. from surface, is going down on the hanging-wall side of the lode, which where cut into shows indications of a rich run of lead ore. We cannot alter the underlie of the shaft to suit the inclination of the lode, or the sinking might go on to the 164 in a rich course of ore all the way. But the whole width of the lode will be seen in opening out for flat in the next level, hence it is really to our advantage to have things as they are. We calculate upon reaching the 164 in three months from now. The 152 west continues to go forward on the hanging wall portion of the lode, which is for width of level worth 7½ per fathom. The new winze just commenced below the said level, and 18 fms. west of shaft, is going down also on the hanging-wall side of the lode, in a course of ore worth 120/- per fathom. As we go down here a much richer lode will be met with, the position of the winze being fixed agreeably with the dip of the main runs of lead westward. The width of the ore-bearing part of the lode along the present bottom level is 12 ft. No. 1 stope, in back of the 152, west of shaft, is worth 43/- per fathom. No. 2 stope, west of ditto, is worth 100/- per fathom. No. 3 stope, west of ditto, is also worth 100/- per fathom. The 142, west of shaft, is suspended for the present, but will be resumed as soon as we have room in the stope below to pack the stuff from the drivage. No. 1 stope, in the back of the said level west, is worth 50/- per fathom. No. 2 stope, west of ditto, is worth 30/- per fathom. The stopes in the 130 west is worth 40/- per fathom. The winze in the 120 west is going down in the centre of the lode, which part is worth 20/- per fathom. The other portions of the lode will come away when the ground is stoned. The stopes in the 110 west are worth 30/- per fathom. The 92, east of cross-cut, on south lode, is 18 ft. wide, worth 15/- per fathom. The 74 east is now 15 fms. from Watson's shaft, and up to the junction of one of the south lodes. The end is forth to a small cavity, out of which a stream of water is flowing equal to two thirds of the whole quantity we have to pump in the mine. This is leading to the drainage of the side lodes in the 62 and 52. As soon as the pool is let down we expect no more than the usual quantity of water. It is impossible to say what is before us in this trial, but important discoveries may be expected judging from the upper sections of the mine. Taking the mine altogether we could never see finer prospects than those now before the company. Having the lead we have to-day sampled 150 tons, which is a week in advance of the regular time.

TANKERVILLE.—A. Waters, Aug. 19: This mine is looking well throughout, as a proof of which lead never was put faster into the vein than now. We have to-day sold 150 tons lead ore, realising 2242/- 10s.

TEESDALE.—Thomas Watson, Aug. 11: Holme's Level Vein Forehead: The vein at this place is working at about the same value as last week—4 bags of lead ore per fathom.—Hockings' Level: The men have this week cut into softer ground, and other 6 or 9 ft. will put the level through into No. 2 vein, where there is a prospect of meeting with more lead ore. I have as many hands at the reservoir and dressing-floor as possible. The work is being pushed on with the view of having some of the lead ore washed up this autumn.

TRELEIGH WOOD.—E. Hosking, W. Goldsworthy, Aug. 18: We have put the 44 east end men to drive south through the lode, which so far as seen is producing the good stones of tin; we expect it will further improve as we get more in the lode. The lode in the stopes above the 44, on the copper part, is not looking quite so well, now worth 6/- per fathom. There is no change to notice in any of the other bargains. We have to-day sampled 13 tons of good quality copper ore.

TREVARRACK.—James Pope, Aug. 18: In the 85 fathoms level, east of engine-shaft, the lode is 15 in. wide, composed of caples, soft spar, and iron, but nothing is in it to value. In the 85 west the lode is 2½ ft. wide, producing stones of tin. The 74 west the lode is 3 ft. wide, composed of caples, iron, and mundic, with good stones of tin.

TYLLWYD (Silver-Lead).—Capt. Paul, Aug. 19: The engine-shaft has been sunk 3 fms. 3 ft. during the past month, and will be down to the 30 in the course of a week, when we shall at once drop lift, which we have on the spot ready, after which the cross-cut shall be started towards the lode, in order to get under the ore seen gone down in the two levels above. The 20 has been driven 4 fms. in the past month, and has much improved, being now fully 3 ft. wide, containing clay-slate, spar, and yielding 1 ton of lead ore per fathom, and bids fair for further improvement as we proceed westward. The two stope are yielding their usual quantity of ore—from 15 to 20 cwt. per fathom. All our surface operations are going on well. The parcel of 20 tons of ore sold on the 17th inst. to Messrs. Nevill, Drane and Co. fetched 14/- 2s. per ton, and we are busy dressing another parcel for sale.

VAN CONSOLS.—J. Roach, Aug. 19: Since my last advice the 7½-in. lift has been set to work in the 40, and is doing well. Driving the cross-cut north in the lode has been resumed, but thus far no alteration in its character since last reported. There is no indication of our being near the north wall, which is the productive section of the lode. We are still making good progress towards making Murray's shaft good to the 25, under the deep adit. Surface work without alteration, and machinery all working well.

VAUGHAN.—Aug. 17: In the deep adit level east the part of the lode now being driven on has become stronger, being composed of a light clay-slate, branches of carbonate of lime, containing occasionally small spots of lead and copper, and has soon to enter the run of grey ground passed through in the level above.

WEST GOGINAN.—J. Kitto, Aug. 14: The main engine-shaft is now down to the 24, and the men are engaged at present in sinking for a fork, which I hope will be completed in a week or 10 days from this date, when we shall immediately commence to cut ledge, and drive out both east and west on the course of the lode. The part of the lode that we are carrying in the sinking is still rich in ore, but the ground is very bad to sink in, and our progress of late has been rather less than I anticipated. It is impossible to say at present how wide the lode is, but we shall soon be in a position to prove this, and I expect a very satisfactory result.

We are getting on very well now with the cutting of wheel pits, water-courses, and reservoirs, and shall be ready to commence building with full force by the middle of next week, and everything will be pushed on as rapidly as possible. A great part of the machinery is ready for delivery.

WEST MARIA AND FORTESCUE CONSOLS.—Wm. Skewis, Aug. 19: Willaston's shaft is being sunk by six men below the 104. In the 104 the lode is taken down, and is fully 4½ ft. wide, producing stones of copper ore and mundic, but not to value. There is one pitch let in back of this level to four men, at

shall be able to wind the stuff from the bottom of the mine with the winding-machine. The 30 west to drive, by four men, at 8/- per fathom; the lode in the 30 point is looking very promising, and the general appearance indicates an improvement at an early date; present value 12 cwt. of lead and blonde ores per fathom. The 30, east of shaft, is suspended waiting the completion of timbering the shaft. The stope in the back of the 20, west of shaft, is let at 3/- 15s. per fathom. Just now we are carrying the stope only 12 ft. long, in order to have communication with the winze under the 10 as quickly as possible; this portion of the stope will yield 8 cwt. of lead and blonde ores per fathom; farther east in this stope the lode is more productive. In the 20, east of shaft, and east of cross-course (price offered), the lode will produce 5 cwt. of lead ore per fathom. The end has a very promising aspect, and I am daily expecting a valuable change. The stope in back of the same level will produce 7 cwt. of lead (price quoted). The stope in the same level, west of cross-course, will produce 15 cwt. of lead ore per fathom; this bargain is outstanding. The winze sinking under the 10, west of shaft, is set to two men, at 6/- per fathom. I propose increasing the number of hands here to quicken the communication with the 20; the lode is producing saving work for dressing. The slight slope over the roof of the 20, east of shaft, as far as opened upon will pay for stopping; the same work will be continued to the eastern cross-course. I trust you have received the sample of the parcel of blonde ore all right.

NORTH HENDRA.—Rd. King, Aug. 17: This morning the lode is rather disordered; it is 4 to 5 in. wide, producing some good stones of copper ore. The ground in the present end is considerably improved; we are now in the best channel of the adit, and I am daily expecting to cut another lode, and should the ground continue as at present we shall make good progress in the right direction.

NEW SOUTH MERLYN.—R. Rowlands, Aug. 19: In the rise at the roof of the north level a good improvement is taking place, and some solid lumps of ore showing. The character of the ground is very satisfactory.

NORTH LAXEY.—R. Rowe, Aug. 18: I intend to go over to the mine on Monday or Tuesday next to go underground, and send you a report, meanwhile there is nothing specially new. We have started the north shaft, and the hoisting of the winze from the 110 to the 121 has given good ventilation, and opened some nice ground for stops.

NORTH POOL.—W. C. Vivian, F. Clymo, Aug. 19: The lode in the 40 continues to produce much blonde, impregnated with yellow copper ore, and is fully 5 feet wide. The rock is becoming easier for driving through, and we trust that this change will lead to the lodes becoming more productive of copper within a short distance. It is our decided opinion that on entering a soft rock formation we shall meet with a good deal of copper.

NORTH TRESKERBY.—R. Pryor and Son, August 17: The lode in the adit west of Doctor's shaft, has very much improved, and is now worth 10/- per fathom of copper ore per fathom, with a good appearance. All other places are much the same as when reported on last week.

OLD TINCROFT CONSOLS.—James Pope, Aug. 18: In the 30 fm. level, west of Diamond shaft, the lode is worth for tin, 7/- per fathom. In the 10 fm. level west the lode is worth for tin 15/- per fathom. To the 10 fm. level west of the shaft, as it is much smaller and requires but little timber. The masons are working on the engine-house as fast as possible.

OLD TREBURGETT.—W. Hancock, W. T. Bryant, Aug. 18: Setting Report: The 90 fm. level, to drive south of the shaft on the lode, by six men, one month, at 7/- 10s. per fathom; worth 6/- per fathom; a kindly lode. The 80, to drive south of the shaft, by six men, the month, at 6/- 10s. per fathom; lode 1½ ft. wide, consisting of quartz and mundic. To stop below the 150, east of the winze, by eight men at 6/- per fathom; the lode is 14/- per fathom. To stop above the 150, east of rise, by two men, at 6/- per fathom; the lode is 13/- per fathom. To drive the 130, east of Cook's shaft, by six men, at 10/- 10s. per fathom; the lode is in the end small and poor, and judging from the level over it will continue so for several fathoms further driving. I have for the time suspended stopping the bottom of the 130, to enable us to resume the sinking of the winze below that level, and as soon as the stuff is cleared out of the stope we shall at once begin to sink. To drive the 108 east, by four men, at 8/- per fathom; the lode is 4 ft. wide, composed of quartz, apatite, and mundic. To drive the 72 east, by two men, at 8/- per fathom; the lode is 3 ft. wide, consisting chiefly of quartz and mundic. To drive the 48 east, by four men, at 6/- 10s.; the lode is still disordered, but yielding a little mundic and occasional stones of yellow copper ore. To stop the back of the 48 east, by four men, at 6/- per fathom; the takers to be paid 8/- for taking down a pitch of lode now standing. The lode in this stope when last taken out was 3 ft. wide, worth 12/- per fathom.

WHEAL CREBOR.—J. Andrews, Aug. 19: The following was our setting on Saturday:—To drive the 120, east of Cook's shaft, by six men, at 10/- 10s. per fathom; the lode is in the end small and poor, and judging from the level over it will continue so for several fathoms further driving. I have for the time suspended stopping the bottom of the 120, to enable us to resume the sinking of the winze below that level, and as soon as the stuff is cleared out of the stope we shall at once begin to sink. To drive the 108 east, by four men, at 8/- per fathom; the lode is 4 ft. wide, composed of quartz and mundic. To drive the 72 east, by two men, at 8/- per fathom; the lode is 3 ft. wide, consisting chiefly of quartz and mundic. To drive the 48 east, by four men, at 6/- 10s.; the lode is still disordered, but yielding a little mundic and occasional stones of yellow copper ore. To stop the back of the 48 east, by four men, at 6/- per fathom; the takers to be paid 8/- for taking down a pitch of lode now standing. The lode in this stope when last taken out was 3 ft. wide, worth 12/- per fathom.

WHEAL GILBERT CONSOLS.—James Pope, Aug. 18: In the adit level west the lode is 6 in. wide, producing good saving tin-stone. Stop in back of the adit level west of cross-cut is 15 ft. wide, per fathom. In the adit cross-cut south the ground is favourable for driving, and we expect to cut the lode in a week from this time.

WHEAL GRENVILLE.—E. Hosking, Wm. Bennett, Aug. 14: Setting Report:

To: Drive to the 160, east of cross-cut, by six men, at 13/- per fathom; the lode is worth 30/- per fathom. To drive the 50, east of cross-cut, by four men, at 10/- per fathom, and 3s. 6d. per ton; the lode is worth 13/- per fathom. To stop above the 160, east of cross-cut, by six men, at 10/- per fathom; the lode is 3 ft. wide, consisting chiefly of quartz and mundic. To drive the 48 east, by four men, at 6/- 10s.; the lode is still disordered, but yielding a little mundic and occasional stones of yellow copper ore. To stop the back of the 48 east, by four men, at 6/- per fathom; the takers to be paid 8/- for taking down a pitch of lode now standing. The lode in this stope when last taken out was 3 ft. wide, worth 12/- per fathom.

WHEAL KITTY (St Agnes).—S. Davey, J. Williams, Aug. 14: New Shaft, Pryor's Lode: We have commenced the cross-cut at the 154, which will be proceeded with all dispatch to reach the lode. The bargains throughout the mine are without change, except the 142 on the counter, the lode has improved, and is now worth for tin 12/- per fathom—a kindly looking lode.

WHEAL PEEROR.—A. T. James, Aug. 17: Sir Frederick's engine-shaft being cut down below the 45, by nine men, at 3/- per fathom; as soon as this work is finished the men will begin to place the pitwork in a proper position, and every effort will be made to fix the pole, &c., as quickly as possible. The two bottom ends—the 60, east and west of shaft—are for the moment suspended, but will be resumed again as soon as the pitwork is completed to this level. In the back of the 60, east of shaft, ten men are working two stope, where the lode is 4 ft. wide, worth 12/- per fathom in each stope. The 48, west of shaft, is being driven by six men, at 6/- per fathom; the lode is 3 ft. wide, worth 15/- per fathom, and presents a very promising appearance. A stop in the back of this level is worth 12/- per fathom. To drive the 130, east of cross-cut, by four men, at 11/- per fathom; the lode is 10/- per fathom. To drive the 130, west of cross-cut, by two men, at 10/- per fathom; the lode is 10/- per fathom. To rise above the 130, east of the cross-cut, by four men, at 11/- per fathom; the lode is 10/- per fathom. To sink the north shaft, on old tin lode, below the 130, by six men and three boys, at 15/- per fathom; the lode is 2 ft. wide, producing saving work for tin. The shaft is now down 10 ft. to the level of the lode. To drive the 130 east of the north shaft, by two men, at 7/- per fathom; the lode is 18 in. wide, producing stamping work. We have also set 19 pitches to 47 men, at an average tribute of 10s. 8d. in 12', the tributaries to be paid at the rate of 45/- per ton for black tin.

WHEAL KITTY (St Agnes).—S. Davey, J. Williams, Aug. 14: New Shaft,

of the ore ranges from \$10 to \$75 per ton, but it is chiefly low grade. Quartz is just the thing needed by the company for flux, and the find is most opportune."

If the Ruby Hill can add quartz ore to its other wonderful treasures it will be of considerable moment to both great companies on its site, the Richmond experiencing also the necessity of obtaining quartz ore to flux its own ores, which are deficient in silica.

The San Francisco correspondent of the *Times*, in last Monday's paper, states:—"Our mineral productions are on the increase, and the recorded public sales by the stock boards aggregate about \$175,000,000. The Great Consolidated Virginia Mine continues to turn out bullion to the amount of \$1,500,000 monthly."

Eberhardt and Aurora shares remain firm, and close 8 to 8½; a telegram has been received from Capt. Drake estimating the June profit at \$28,000, and that for July at \$35,000; the half-year's accounts and report will be mailed on Aug. 24. The last weekly reports received show that the cause of the shorter run in July was that the mill had been shut down from July 3 to July 9, making a difference in the out-turn of the month in money value of something like 3000\$, and about 2000\$ in the profits. The grade of the ore in July had been very much better than in June, consequently a further improved return for August is expected. The ore-dumps at the mill are being gradually increased in anticipation of the winter, and the necessary stores and supplies are also being accumulated. The current profits are at the rate of between 70,000\$ and 75,000\$ per annum, upon a capital of 260,000\$.

The Gold Quartz Mines have been more actively dealt in, and St. John del Rey, Port Phillip, and Javali have changed hands at somewhat improved quotations. St. John del Rey closes 395 to 405; the advices state that the lessened result realised during June, as compared with the preceding month, had been caused by a temporary supply of inferior mineral, which for a few weeks cannot be avoided; but the executive house shortly to be able to note a considerable improvement in richness as well as in quantity. As already stated, the profit for June was 11,788\$. Don Pedro, ½ to ¾. Port Phillip, ½ to ¾. A telegram, received the 16th inst., states:—"The yield for the month ending Aug. 11 was 6 dwts. per ton. The western reef yielded 6 dwts. 7 grs.; and the eastern reef 12 dwts. 8 grs. per ton. Lode widening to 20 ft. Remittance, 650\$. Chontales, ½ to ¾. Javali, 9-16ths to 11-16ths. A telegram has been received announcing the July return at 605 ozs., and the profit 900\$ sterling. Water power abundant; 30 stamps at work. Almada and Tiriti, ½ to ¾; Sierra Buttes, ½ to ¾; ditto Plumas Eureka, ½ to ¾; the Sierra Buttes receipts for July were \$33,183, and the Californian expenses \$21,875. The Plumas Eureka receipts for July were \$30,174, and the Californian expenses \$17,516. In addition to the foregoing yield from the Plumas Eureka 75 tons of sulphurates has been saved, which is expected to yield about \$80 per ton. London and California, ½ to ¾; Independence, 2½ to 3; Frontino and Bolivia, ½ to ¾.

Lead Mines have been represented by Van at 24, 26; the various points of operation fully maintain their value, and the general prospects of the mine continue most favourable: the sampling has been made this week, amounting to 500 tons of lead and 150 tons of blonde, Pateley Bridge, 7 to 7½; the "new discovery" continues worth 20¢ per fathom; the agent reports that next week he expects to cut the ledges in the two cross-cuts that are being put out at the 20 under the old workings, and that within two months will be rendered available the lode in the shaft, where a rich course of ore has gone down. Smelting has been commenced, and the various works are proceeding regularly, and with every promise of success. South Cwmystwith shares have changed hands at 1 premium; the management has been placed in the hands of Mr. John Kitto (of the successful Grogwinion Mine), which is a sufficient guarantee that every detail will be carried out with experienced skill and ability.

Van Consols, 2 to 2½; the works are progressing with the utmost regularity. Great West Van, 10s. to 15s.; Capt. Hodge continues to repeat his conviction that a good lode is ahead in the 34 cross-cut from Eliza's. Port Nigel, 1½ to 1¾; an important discovery has taken place at this mine during the last few days. In driving the bottom level (56 east) 10 fathoms from shaft the lode has been cut yielding from 1½ to 2 tons per fathom, and every indication of improvement.

In the 56 west, 9 fathoms from shaft, a new shoot has been cut, entirely distinct and separate from that to the east of the shaft, the present value is from 1 to 1½ ton per fathom. At the 44, 16 fathoms east from shaft, there is also an important change, the present value of this end alone being 20¢ per fathom. A sale of 45 tons of lead ore and 10 tons carbonate of lead has been made this week. Aspineton, 1½ to 1¾; a discovery of some importance is reported.

Bog, ½ to ¾; the new winze below the 163, in advance of the 175, is opening out rich for lead and blonde. The new drawing engine works well. The sinking of the shaft below the 175 will be resumed shortly. The sale of ore next week will be 45 tons of lead and 55 tons of blonde. Penneyer, 1½ to 1¾; the various points are yielding fair quantities of ore, and the prospects of the mine are more promising than last reported: 80 tons of lead ore have been sampled for sale on the 25th inst.

Cathedral, 25s. to 30s.; the 30 west has further improved to 25¢ per fathom. The next sale, of 60 tons of copper ore, will be on Sept. 2, Penstruthal, 8s. to 10s.

Subjoined are the closing quotations:—

Asheton, 1½ to 1¾; Bog, 8s. to 10s.; Devon Great Consols, 2½ to 3; East Cardon, 3½ to 4½; East Lovell, 7 to 8; East Van, 1½ to 1¾; Great Laxey, 11 to 15; Great Wheal Vor, ½ to 1½; Huntington Down, 1½ to 1¾; Marke Valley, 1½ to 2½; Pateley Bridge, 6½ to 7½; Parry Mountain, ½ to ¾; Peneberry, 1½ to 2½; Penstruthal, 8s. to 10s.; Roman Gravels, 1½ to 2½; Tankerville, 1½ to 2½; Tincroft, 18 to 20; Van, 24 to 26; Van Consols, 2 to 2½; West Chiverton, 15 to 18; West Tankerville, 1½ to 1¾; Wheal Grenville, 2½ to 3; Birdsye Creek, 1½ to 1¾; Cape Copper, 33½ to 34½; Cedar Creek, ½ to ¾; Colorado Terrible, 1½ to 2½; Eberhardt and Aurora, 8 to 8½; Emma, 1½ to 1¾; Fagstaff, 1½ to 2½; Independence, 2½ to 3; Last Chance, 1½ to 1¾; New Quebec, 3½ to 4½; Richmond Consolidated, 12½ to 13½; South Aurora, 8s. to 10s.; St. John del Rey, 30s. to 40s.; Sweetland Creek, 2½ to 3½; Tecoma, ½ to ¾; United Mexican, 2½ to 3½; Blue Tent, 4½ to 5½; Holcombe Valley, ½ to 1.

At the Truro Ticketing, on Thursday, 2194 tons of copper ore were sold, realising 11,187½s. The particulars of the sale were—Average standard, 122½ 2s.; average produce, 6½; average price per ton, 5½ 2s.; quantity of fine copper, 141 tons. The following are the particulars of the sales:—

Date. Tons. Standard. Produce. Per ton. Per unit. Ore copper. July 20... 3473 ... £24 7 0 ... 6½% ... £4 17 6 ... 14s. 7½d. ... 273 3 0 ... Aug. 5... 180 ... 110 7 0 ... 8 ... 6 3 0 ... 15 3 ... 76 4 0 ... " 204 ... 122 3 0 ... 6½% ... 5 2 0 ... 18 10% ... 79 7 0

Compared with the last sale, the advance has been in the standard 4½ 10s., and in the price per ton of ore about 6s.

SHEFFIELD.—Mr. J. R. Heard, stock and share broker, in his weekly report says—Very little business has been done this week in our local shares, owing principally to the Royal visit. Stock Exchange closed on Monday and Tuesday. Parkgate flat, a fall of 3 per cent, having taken place. The following are current rates:—Bilbao Iron Ore Company, 4½ to 4½; Bolckow, Vaughan, and Co., 14 to 14½ prem.; Brown Bayley, and Dixon, 28½ to 27½ dis. 28; Charles Cannell and Co., 11 to 10½ dis. 11; Charlton Iron Company, 12½ to 14½; Chillingdon Iron Company, 4½ to 5½; Ebbs Vale Steel and Iron Company, 12½ to 12 dis.; G. and J. Brown and Co., 50 to 75 dis.; Hopkins, Gilke, and Co., 6 to 6½ dis.; John Brown and Co., 7½ to 7½ prem.; Parkgate Iron Company, 15 to 16 prem., 15½; Sheepbridge Coal and Iron Company, 24½ to 24½ prem.; Staveley Coal and Iron Company, 62 to 62½ prem.; Sheffield Waterworks Company, 97 to 98; Sheffield Gas Company, 205 to 205; William Clarke and Co., 14 to 14½ dis.

WYR VALLEY (Lead).—The half-yearly dividends, at the rate of 10 per cent. per annum, have been posted to the shareholders.

The directors of Bolckow, Vaughan, and Company (Limited), Middlesborough, have decided to pay an interim dividend at the rate of 7½ per cent. per annum.

The Capel Carig Slate and Slab Quarry Company (Limited) are paying an interim dividend for the past half-year at the rate of 6 per cent. per annum.

Vice-Chancellor Sir Richard Malins has appointed Mr. G. A. Cape (Cape and Harris), of Old Jewry, official liquidator of the Peat, Coal, and Charcoal Company (Limited).

The creditors of the New Merrybent and Middleton Tyas Mining and Smelting Company (Limited) are requested to send particulars of their claims to the liquidator.

SAFETY FOR RAILWAY TRAVELLERS.—Two novel applications of telegraphic communication as a means of procuring greater safety for persons travelling by railway are now on view at the offices of Mr. W. Smith, C.E., Salisbury-street, Adelphi, both of which have been patented by Messrs. Garnham and Co., electric telegraph engineers, of Finchley. The first professes to provide the means of immediate communication between a railway passenger and guard in case of accident, illness, or assault; and the second is intended to prevent the collisions which so frequently

occur at railway junctions. The first is the invention of Messrs. Stroudley and Riesbridge, of the London and South-Western Company, and consists of the furnishing of a set of electric keys to each compartment, which keys are in connection with the electric wires, and are provided with bells, by means of which an instant alarm can be communicated to the guard in the brake van. The passenger has merely to touch a button placed over his head in the wood work which divides the seats when the bell immediately sounds in the brake van, the train is stopped, and the guard comes to ascertain what has been going wrong. The intention of this invention is not to supersede but to assist the present cord, and to be available under circumstances when the cord might not be in good working condition. An important feature in it is that it sounds an alarm at both ends of the train, so that if the latter has been divided in the middle by any accident, such as failure in the coupling irons, the passengers still have the means of communicating either with the guard or driver. When a signal has once been made the bell does not ring until means have been taken to remove the cause of alarm. The other invention is the patent train signalling apparatus, also exhibited by Garnham and Co., and its object is to provide a means of electric signalling which shall stop trains when approaching a junction, and thus obviate the possibility of collision. The up and down signals are placed on different halves of the dial, and an ingenious contrivance is provided which renders it impossible for the signaller to give the wrong signal. The London, Brighton, and South Coast Railway Company have already adopted both inventions, and their officers speak in approving terms of their value and importance.

INTERESTING GEOLOGICAL DISCOVERY.—Recent excavations for a new tidal basin at the Surrey Commercial Docks have given rise to rumours of interesting geological discoveries, the place has just been visited by some of the members of the Geological Society of London, under the guidance of the Rev. E. Jocelyn Bleek, Rector of Rotherhithe. The excavations are found to be just within the principal entrance of the Docks, a few minutes walk from the Cherry Garden Pier on the Thames, and are several acres in extent. On penetrating some 6 ft. below the surface the workers everywhere came across a subterranean forest-bed, abounding in rooted trees of the species still inhabiting Britain. The oak, alder, and willow are apparently most abundant. The trees are not mineralised, but retain their vegetable character, except that they are saturated with water, and in the peat are found bones of the great ox (*Bos primigenius*) and shells, the river cycles being in some places plentiful. These and other circumstances enabled the visitors to read the true history of the formation. No doubt is entertained that the bed thus exposed is a continuation of the old buried land-surface which has on several recent occasions been brought to the daylight on both sides of the Thames, notably in the year 1869 at Walthamstow, in connection with reservoirs for the East London Waterworks Company; in 1862 at Plumstead Marshes during excavations for Southern Outfall Sewer; and a few months since at Westminster on the site of the new aqueduct. In each instance the forest-bed is found buried beneath the marsh clay, showing that the land below tidal level since the forest flourished. The earliest account of it is given by Capt. Perry, the famous engineer, who repaired Dagenham Branch, and dug into it some 150 years since. It is well known to geologists that this same subterranean forest tract crops out under the bank of the Thames in several places between Woolwich and Erith, and there are Thames watermen still living who knew the trees by the name of "Moorlog" (Capt. Perry's name for them), and used them for mooring their barges. So far the discovery of animal remains at the Rotherhithe excavations has been limited in comparison with those found at Walthamstow, but the correlation of the physical features of the two places and the general evidence are held to show that the forest belongs to the period of the elk and reindeer in the South of England, and possibly to the bronze age of pre-historic archaeology. The sections at Rotherhithe are at present in admirable condition for showing the succession of the beds in which the peat and trees occur, and the trees themselves may be seen *in situ*.

AUDIBLE DANGER SIGNALS.—A simple and efficacious signal, appealing to other senses than that of sight, has been invented by Capt. John Boulton, of Edinburgh. The features of novelty are—a projection made to rise between the rails, working either in connection with a danger signal, or placed on any part of the line. This projection operates on the apparatus for giving the alarm after-mentioned. This apparatus is carried by the engine or any of the carriages, and the bottom or dependent arm of this apparatus is made to swing on a pivot, and the apparatus being carried at a lower level than the top of the projection, and so placed as to strike the projection, the dependent arm must rise to enable it to pass over the projection. The dependent arm is so formed at the top that on being raised by the projection as aforesaid the shoulder of the dependent arm rises to a higher level than the top of it while at rest, and in so rising lifts a rod resting on the top of it. This rod being thus raised presses a spring, and thus withdraws a small bolt by which a chain or cord is retained. The other end of this cord or chain is attached to the object which is to be operated upon, in order to attract the attention of the man in charge. The object which is to attract attention may be either a bell or the steam-valve of the engine, or a broad coloured plate, or other prominent object, and may be either a part of, or attached to, the engine or carriage, and will be so acted on by a spring or weight that on the bolt being withdrawn and the rod released as aforesaid, the steam whistle or bell, or the prominent object, will remain sounding, or exposed, as the case may be, until the attention of the man in charge is called to it.

WALLASEY FERRIES.

TENDERS FOR ABOUT 10,000 TONS OF STEAM COAL.—THE WALLASEY LOCAL BOARD are prepared to RECEIVE TENDERS for the SUPPLY OF STEAM COAL (screened) for the use of their steamers, for a period of twelve months. Tenders to state price per ton, delivered free on board flats at any shipping place on the Mersey. Quantity, 150 to 200 tons per week, as required. Payments net cash monthly.

Any further information may be obtained on application at the manager's office, Egremont Ferry.

Sealed tenders, addressed to the "Chairman of the Ferry Committee," and endorsed "Tender for Coal," to be left at my office, Church-street, Egremont, near Birkenhead, not later than Three o'clock in the afternoon of Wednesday, the 18th day of August instant.

The Board do not bind themselves to accept the lowest or any tender.

By order,
T. SOMERVILLE JONES, Clerk to the Board.

Public Offices, Egremont, August 6, 1875.

TO MINING PROPRIETORS.

WANTED, a RE-ENGAGEMENT as a MINING AGENT, or as a MINING SURVEYOR. Can assay all kinds of mineral, and is a good accountant. Can produce unexceptional references.

For references, apply to "B. C." Post Office, Cramlington, near Newcastle-on-Tyne.

TO CHARCOAL BURNERS.

Accustomed to the MANUFACTURE of ANIMAL and OTHER CHARCOALS.

WANTED, a PRACTICAL MAN, who understands KILN and RETORT PROCESSES. Will be required to reside in the country.

Apply, by letter, stating experience, references, and wages, to "D. P." Mr. W. Abbott's, 46, Eastcheap, E.C.

CARBONATE OF BARYTES.

WANTED TO PURCHASE, in LARGE or SMALL QUANTITIES.

State strength, and quote lowest price to W. BOUSTRED, Barytes Manufacturer, Nox, near Shrewsbury.

WANTED, a Gentleman to find £100 to REGISTER a COMPANY, and to MAKE some small PRELIMINARY TRIALS to WORK a LEAD and COPPER MINE in PEMBROKESHIRE.

Samples of the lead ore, which is nearly or quite pure, and the copper ore, may be seen, and all particulars ascertained, by addressing "F. A." MINING JOURNAL Office, 26, Fleet-street, London.

A CLERGYMAN desires to meet with someone who has influence in the FORMATION of MINING COMPANIES, to ASSIST HIM in WORKING or DISPOSING OF a VALUABLE MINERAL PROPERTY, in which he has discovered veins of COPPER, LEAD, BLEND, and some SILVER and GOLD.

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yielding about 53 per cent. metallic iron, free from phosphorus. Situated close to a good Norwegian Harbour, with accommodation for loading the largest vessels. Charcoal is obtainable at the same place.

Apply to M. A. Nissen and Co., Christiania.

TO BE SOLD, the LIFE INTEREST in about NINE HUNDRED ACRES of COAL, about three miles from DONCASTER. The coal is not developed yet, but is pronounced by eminent civil engineers to be about 450 yards below ground. Will anybody make an offer for the above?

Apply to Sir W. Cooke, Bart., Post Office, Torquay, until 26th inst.

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FOR SALE, a splendid 30-in. cylinder PUMPING ENGINE, 10 feet stroke in the cylinder and 9 feet stroke in the shaft; with or without ONE OR TWO BOILERS, complete.

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FOR SALE, An EXTENSIVE and PROSPEROUS SLATE and SLAB QUARRY in NORTH WALES.

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FOR SALE, a splendid 40-ft. WATER-WHEEL, 4 ft. breast, with double-gearred drawing machine, balance-bob, and connection—all complete.

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ZINC AND LEAD ORES MIXED TOGETHER.

Particulars by letter.

NOTICES TO CORRESPONDENTS.

* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

SIR.—Will any reader kindly inform me if they know of a market for Talc, which has a beautiful display of colours—2. If there are any buyers of Ferro Manganese, containing 14 per cent. of manganese—3. The names and addresses of two or three purchasers of Iron Pyrites—4. The names and addresses of two or three purchasers of Blende?—INTERESTED.

BINOXIDE OF MANGANESE.—“J. T.”—Messrs. John Macqueen and Son, Old Jewry Chambers, can supply the specimens required for in last week’s Journal, and would also undertake to supply all kinds of manganese in quantity.

FULVISER.—“A. G. S.”—The exact address is not known, but the address of the inventor is believed to be Bristol.

YORK PENINSULA MINING COMPANY—ERRATUM.—In the report of the meeting of this company, published in last week’s Journal, the quotation from Captain Anthony’s report should have run thus:—“It is not in my power to furnish a reliable estimate of the ore that this piece of the lode will yield, but taking it at 20 fathoms long by 30 high, and its yield to be 4 tons of twelve (not “four”) per cent. ore per fathom, would give 2400 tons at £1. per ton, or equal to 14,400£.”

Liquid Fuel.—Prof. Henry Wurtz’s paper on a New System of Oil Metallurgy will appear in next week’s Journal.

SHARE DEALING.—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broker through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

VISITS TO THE MANCHESTER EXHIBITIONS.—These articles will be resumed in next week’s Journal.

Received.—“M.” (Glasgow)—“Another West Jewell Shareholder”—“J. B.”—“W. P. J.” (Turin)—“T. H.”—“A. Miner” (Portage Lake)—“Miner” (Redruth); No.—“E. R.”—“Tourist.” The letter could only be had with the writer’s name appended—“M. D.” (Mining Audit): Next week.

IMPORTANT NOTICE—REDUCTION OF POSTAGE ON THE “MINING JOURNAL.”—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the *Mining Journal* to many countries will be reduced to one-fourth. Henceforth the subscription will be 17. 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber’s residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxembourg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Serbia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 17. 19s. (50 frs.).

AVIS IMPORTANT—AUTRES ADONNES ETRANGERS DU “MINING JOURNAL.”—A cause de la nouvelle CONVENTION POSTALE il y avait, à partir du 1^{er} Juillet 1875, une grande diminution du prix de l’abonnement du *Mining Journal* pour bien des pays dont le taux des postes était jusque là bien élevé. À partir du 1^{er} Juillet le prix de l’abonnement est de 39 frs., le port compris, pour l’Autriche, Belgique, France, Danemark et ses dépendances, l’Egypte, l’Allemagne, la Grèce, l’Italie, Hollande, Portugal et ses dépendances, Roumanie, Russie, Serbie, Suède, en Suisse, la Turquie, l’Afrique septentrionale, etc. Le montant, si l’on le veut, sera touché à domicile, la fin de l’an. L’abonnement continuera sauf avis contraire.

THE MINING JOURNAL,
Railway and Commercial Gazette.

LONDON, AUGUST 21, 1875.

STEEL AND IRON.

In connection with the mostly depressed condition of the finished iron trade of the country has to be noted the steady progress of steel in supplanting iron for numerous uses in which it was before almost exclusively applied. The readers of the review of “Foreign Mining and Metallurgy” in last week’s *Mining Journal*, will have noticed it recorded that “steel has been selling rather more freely than iron in France,” with the further remark to the effect that the prices at which the steel has been sold “show more than ever the triumph of steel over iron.” That steel is destined to supplant iron in numerous mechanical and constructive operations has long been foreseen by the metallurgists, and this Journal has not failed to note the progress of the transformation. The attention we have hitherto given to it we propose to continue, for the theme is one which should be fraught with economic suggestions of much import alike to the maker and to the consumer of the two metals. Unprecedented impetus was given to the use of steel when BESSEMER demonstrated the practicability of the process with which his name is associated. Great things had been done by the crucible in England and in Germany, but when, instead of many tiny crucibles being needed to produce one massive ingot, one converter could be made to manipulate several tons of metal an economy of time and of labour was the result, from which advancement became inevitable. Not only were vast forces at once attainable, but attainable at a price which was before impossible, and the looming of the steel age yet to be set men thinking and experimenting, till now, by the Siemens-Marten direct process, by the direct process also on the Bessemer principle, as well as by the combined use of many crucibles, no difficulty is found in obtaining steel for forgings of almost any practicable weight. No doubt steel is still a comparatively high-priced metal because of the necessity which is believed to exist for the employment in its make of only first-class ores, but, as compared with the early quotations of the makers, the prices which now rule are very low. Further, there is some room to hope that even the poorer ores may be made to produce good steel. The Cleveland hills, it is believed, may yet be made to turn out not iron rails only, but likewise steel rails, and experiments which are now being conducted with the Northampton ore by the aid of the inventive and mechanical ingenuity of Mr. SIEMENS may demonstrate the capability of even that mineral to yield steel direct from the ore.

However unsuccessful certain of the American steelmakers may have been in producing steel which afford results as satisfactory as those which were obtained under certain conditions from forged iron, leading engineers throughout the Old World are increasing in the confidence which they have now for some time entertained in the greater adaptability to specific uses of steel over iron; and by-and-by they will closely apply themselves to the solution of the question of what is iron and what is steel, which now and again forces itself upon their notice when they are experimenting. In the interests of the two metals, and of the advancement of mechanical science, it is of importance that this should be done; and Sir JOSEPH WHITWORTH himself, only so recently as the meeting at the close of last month, in Manchester, of the Institute of Mechanical Engineers, pointed to the want of a strict definition distinguishing at once between wrought iron and steel. Sir JOSEPH suggested that the limit of tensile strength should be taken at about 28 tons per square inch, so that the metal exceeding that strength should be called “steel,” while any description of iron falling below that limit of tensile strength should be known as “wrought-iron.” Sir JOSEPH is one of our foremost experimenters in steel, and his experiments have given him growing confidence in the capabilities of the metal. His process of compressing steel in a fluid state has enabled him to secure at once an increase of ductility and of strength. But Sir JOSEPH is not the only man who is bringing to bear upon this question great scientific and mechanical knowledge, as all will remember who were present at that meeting of the Iron and Steel Institute at which the paper of M. JULIEN DEBY, of Brussels, was read, “Upon the Manufacture of Bessemer Steel in Belgium.” The adaptability of the metal to uses to which it had been only partially applied in this country was there pointed out by some of our foremost metallurgists. What was said was duly printed in these columns, and we need not go again over that ground. Our duty is to continue to point from time to time to the growth of the adaptation of steel to uses before met by iron. The readers of the Journal will have noticed in connection with the visit of the Staffordshire ironworks managers to the Crewe Railway works that they there found that Mr. WEBB was not only keeping his Bessemer and Siemens-Marten apparatus at work in making steel rails, and tyres and axles, but that he was likewise using that metal for the frame-plates of the locomotives, and was re-working old tyres into strip for locomotive tubes. The steady economy which is now being practised by the railway companies by using steel upon their permanent way continues to make itself evident. Not only do the engineers’ reports,

as recently presented at the shareholders’ meetings, show that this practice is being continued in proportion to the funds available, but enquiries now reaching steel-making firms show that the transformation is proceeding in a growing ratio. The Great Northern Company tell us that in the first half of this year they have laid 34½ miles of single line with steel rails, and that the distance is 7½ miles increase upon the distance laid with steel rails in the previous six months. Then we have even so comparatively small a service as the North Staffordshire line re-laid with steel where the traffic is heavy, and with iron only where it is light. One of the enquiries now in the market is for 5200 tons of steel rails, but for only 1100 tons of iron rails.

With what regularity steel will make its way over iron in marine uses, apart from engines, has yet to be shown. It is, however, noteworthy that our own Admiralty are experimenting with steel in respect of two dispatch boats lately ordered. In this they are proceeding with the caution which is so characteristic of Great Britain. Mr. REED has already informed the iron trade that he has used steel in shipbuilding for foreign Governments, and that he should have used it largely, in preference to iron, if other naval engineers had been so far accustomed to use it that their specifications would have encouraged steel producers to make those arrangements which would enable them to quote prices justifying him in ordering steel instead of iron. And our quotation at the beginning of this article, taken from our foreign intelligence of last week, was associated with the requirements of the French Navy for steel-plates. Therein it was pointed out that a recent adjudication for the French Navy at Rochefort, MM. SCHNEIDER and Co., in tendering for steel-plates at 19. 15s. 6d. per ton had beaten the John Cockerill Company, of Liège, by 8s. 6d. per ton, and had, therefore, obtained the order. Beyond doubt neither 19. 15s. 6d. nor 20. 4s. could bring much profit to either the French or the Belgian firm, but that it should be possible for such figures to be quoted is indeed a striking indication of “the triumph of steel over iron.” And this triumph will become more conspicuous as the difference in the quotations for the two metals is narrowed by the reducing of the charges which now attend the smelting of the metal in our own country. The reduction in the price of steel which has lately been possible has had much to do with the increased use of the metal, and if our metallurgists and engineers should be successful in producing it from the poorer stones and ores then the displacement of iron now going on will be much more conspicuous. While it is true that just now the steel trade, no more than the iron trade, is in a flourishing condition, still the proportionate demand is decidedly in favour of steel. The question is one which ironmakers in particular should keep constantly in mind and should closely watch. If they are to make their existing plant profitable they will have to give much thought to the producing of iron of a quality superior to that previously made from the same materials, and with less dependence upon expensive and variable manual labour. At the same time we do not despair of the practicability of certain existing iron-making plant being adapted to the making of rolled steel; and if experiments which are being quietly, but certainly, made should result in all that is anticipated this will be possible. The transformation, therefore, at the same time that it is one which has its grave aspects, is not devoid of features of encouragement, even to those ironmasters who may at first sight appear to have cause least to desire its success.

MINERS’ WAGES, AND MINERS’ UNIONS.

At the present time the coal trade appears to be passing through one of those periodical crises, the result of which will be felt in the future, either as beneficial or otherwise to all connected with it. On the one hand we have the colliery owners urging upon the men the necessity of their quietly submitting to a reduction of wages, so as to allow of their keeping their pits going, seeing that in many instances no profits whatever are being made, whilst in others they are not sufficient to pay ordinary interest for the capital invested. On the other side the men, or rather their leaders, state that the present rate of remuneration is fully justified by the price of coal in the various markets. The latter proposition we have no hesitation whatever in saying can in no way be borne out by actual facts. If we look to what is now being paid at the pits for every description of coal we find that it is something like what it was in the latter part of 1871, when wages were considerably less than they now are, and when the expenses in working a colliery were very much less. If we take the London market as a test, and writing with the price lists before us, we have the clear fact brought out that coal was then actually cheaper than it is now. There is, therefore, not the slightest ground for the assertion that the wages of the miners are only consistent with the profits of the employers. It is, no doubt, a very unpleasant thing for a workman to have his income reduced some 2s. or 3s. per week, but then it has been the lot of most workers at one time or another to submit to such an infliction, and least of all should the miners object to agree to what others have had to submit to under precisely similar circumstances. For the last two or three years at least they have reaped a glorious harvest, luxuriating in wages exceptionally high even for the most skilled craftsmen we have, whilst in the districts they are connected with they have been the means of raising the price of provisions as well as every other household article. Indeed, nearly the whole of the working population of the kingdom have been taxed heavily for their fuel for the purpose of keeping up the wages of the miners.

But even the very high wages paid to the miner has not benefited him to the extent that is generally believed. It is admitted that the sovereign of to-day as a purchasing medium is not more than equal to the 15s. or 16s. of a very few years ago. The increase in the price of one article naturally leads to the increase in the price of others. Dear coal makes iron, steel, and every other article in which fuel is essential for its production correspondingly dear. The collier, therefore, on whose behalf such great efforts have been made, and vast sums of money expended to keep up his wages, finds that with an advance of 20 per cent. he is no better off, and that he has largely contributed to his own and others discomfiture. He has by strikes and other means managed to keep up wages, and in so doing has in no way benefited himself and others, but done great injury, especially to the iron trade. But as yet he has not learned wisdom by past experience, and is ready to oppose any reduction of wages, irrespective of the fall in the price of coal, or of production being greatly in excess of the consumption. Even at the present time there are hundreds of men on strike in Warwickshire against any reduction whatever, as there are also in other districts as well. Not only so, but combinations are being formed for the purpose of keeping up wages by the mere power of numbers. A federation of the various bodies of miners has been formed, and next week the Amalgamated Association, of which Mr. T. HALLIDAY is the president, is to meet at Shrewsbury, for the purpose of adding the remnant of his forces to the National. This great Union is expected to be sufficiently powerful to regulate wages, and to support any number of men who may be on strike. The same tactics, however, are being adopted by the great employers of labour for their own protection, and we have no fear as to the result of a collision between labour and capital whenever it may take place. But we certainly should not envy the feelings of the men who precipitated such an event.

We have no objection to Trades Unions where the objects desired will really benefit those belonging to them without infringing on the rights of others. But such has not hitherto been the case, and this has been very clearly pointed out in a paper recently read at the Yorkshire Co-operative Conference, held at Leeds. Most of those present were working men, and a Mr. J. PONTEFRACT read a paper on “Trades Unions, Strikes, and Co-operation.” He started with the statement that whenever one class of workmen strike for an unreasonable advance, or for above the market rate of wages, and get it, “they know and intend that some other class will have to pay for that advance, and that they place a false issue on the struggle when they tell us they intend to get it out of the employers’ pockets.” Mr. PARKER went on to say that unionism meant raising the idle and incompetent workman to the level of the industrious—the competent and skilful workman—and that the very spirit and

essence of it was pure, unmitigated, unadulterated selfishness, and illustrated his assertion by stating that a little more than a couple of years ago the mills and factories were closed, and the workers had to walk the streets for want of coal, and the miners would not get coal. And why? Because they were the masters of the situation. As might be expected, these truths were far from palatable to the audience. But it is a healthy sign of the times when the real character of the unionists is given in such terms before an assembly composed mostly of workmen, and cannot fail to make an impression on the most thoughtful of them, and ultimately lead to their emancipation from the servitude which is the peculiar feature of unionism, which deprives the working man of every vestige of freedom and independence.

ENGLISH COAL ABROAD.

The exports of English coal from the United Kingdom were on a considerable scale in July, having amounted in that month to 1,545,263 tons, as compared with 1,302,669 tons in July, 1874, and 1,181,622 tons in July, 1873, so that reduced prices are thus again beginning to stimulate external consumption. The exports of English coal to France in July attained the very substantial total of 221,742 tons. We read of considerable progress being made in the utilisation of the vast coal resources undoubtedly possessed by France—such progress being especially noticeable in the departments of the Nord and the Pas-de-Calais. The combined coal extraction of these departments will, it is said, present an advance of 50 per cent. this year upon the corresponding production of 1870; but notwithstanding this, the imports of English coal into France last month presented an advance of about 11,000 tons as compared with the corresponding period of 1874. An advance in the imports at the rate of 132,000 tons per annum is a fact of some significance, and would seem to show that France has no natural genius for coal mining. If she had, she would, no doubt, long since have rendered herself independent of her neighbours in the matter of coal; but as soon as she can obtain the coal of other countries upon something like reasonable terms, she appears to be only too happy to avail herself of it. Some 15 years since the Second Empire endeavoured to rouse the public opinion of France upon the importance of the French becoming more independent in regard to imports of coal, and of relieving themselves of the coal “tribute” which they paid annually to neighbouring nations. At that time, the French imported some 1,000,000 tons, or 1,200,000 tons, of coal annually from Great Britain; now their imports, after 15 years’ discussion—and probably, as we ought also in fairness to add, after 15 years’ efforts—have grown to 2,500,000 tons of English coal annually, to say nothing of the coal which they are fain to purchase in Belgium and Germany, and which must amount in volume—although, of course, the imports into France of German and Belgian coal fluctuate year by year—to at least twice as much again. France thus still imports between 7,000,000 and 8,000,000 tons of coal annually, although the efforts made to increase the extraction of coal from the French soil have not been by any means barren of results.

The coal production of France now amounts to about 16,000,000 or 17,000,000 tons annually, so that the annual consumption of coal in France must be approaching 25,000,000 tons, or about one-fourth the corresponding consumption of Great Britain. Here we have an explanation of the substantial increase which has taken place in the consumption of English coal in France, notwithstanding the persevering efforts made during the last 10 or 15 years to increase the production of French coal. The consumption of coal in France has outstripped all the efforts which the French have made to keep pace with it, the constant development of railways, steam-shipping, and steam-impelled machinery, baffling all attempts to provide adequate supplies of French coal.

Coal having fallen in Belgium, Germany, and in France itself, as well as in Great Britain, the rather interesting practical question which now awaits a solution at the hands of the future is, “Will the diminished profits which are likely to result from French coal mining operations have the effect of causing the French to relax their new-born zeal for the utilisation of their native coal?” The fall which has taken place in coal prices upon the English markets during the last 12 months has been about 25 per cent., and a more or less similar fall has been witnessed in French, Belgian, and German coal. It is not very easy to effect all at once a corresponding diminution in working expenses, and we are led somehow to the conclusion that for some time to come French coal mining balance-sheets will present less brilliant results.

COAL-CUTTING MACHINERY.—In the Journal of June 19, Mr. William Maddison, certified manager of the Woolley Collieries, promised that the result of the trial of the relative merits of the Gillott and Copley (rotary) machine, and of the Firth (pick) machine should be published as soon as known. Much interest attached to the trial in consequence of its being the first occasion upon which the two principles could be tested in the same coal (the Barnsley Thick seam), and under the same conditions. In the Supplement to this day’s Journal Mr. Maddison has redeemed his promise, and his communication there published is one of great value to all interested in the question of machine coal cutting. The relative value of the two principles may now be regarded as definitively settled.

ECONOMY OF MACHINE COAL-CUTTING.—The commercial advantage of machine-boring as compared with hand-boring in the Barnsley seam, apart from the consideration of the class of machine used, is clearly shown in a pamphlet just issued by Mr. W. Firth. In hand-boring a triangular groove 3 ft. 6 in. deep is made (18 in. to 0·9 in. average), and the coal is left so firm as to require bringing down with powder. By the machine a 3-in. groove 3 ft. 6 in. deep is made, and the coal can be easily brought down without powder. When the machine is used the collier is never in the position to be injured by the falling in of the groove. Cut by hand, each acre yields 2976 tons of large at 11s. 6d. = 1711. 4s., and 3224 tons of small at 4s. = 644. 16s., together 2356. Cut by the pick machine, each acre yields 4650 tons of large at 11s. 6d. = 2673. 15s., and 1550 tons of small at 4s. = 310. 16s., together 2983. 15s., showing an increased profit per acre by using the machine of 627. 15s. Mr. Maddison considers that in addition to this the use of machine cutting secures great saving of life and personal injury.

IRONMAKING BY MACHINERY IN NORTH STAFFORDSHIRE.—The adaptation of rotary puddling to the making of finished iron has been strikingly successful in North Staffordshire. At the Ravensdale Works of Mr. Robert Heath, ten Danks furnaces are in use producing heavy plates of a quality much superior to those obtained from the same materials by hand-labour, and at less cost. Some practical ironmakers had feared that the system was not applicable to the making of the smaller sizes of finished iron. Small squares, narrow hoops, and even nail-rods have, however, been now produced by the Danks process, solely from North Staffordshire pig-iron, of a quality equal to that got by hand puddling from pig-iron very much higher in price. The hot and cold tests to which the iron has been subjected leave results which should largely stimulate the well-directed employment of machine puddling. The Iron and Steel Institute, at their forthcoming autumnal meeting in Manchester, will give a day to North Staffordshire, devoting their attention mainly to what is being done there by the Danks machinery.

COAL AND IRON IN THE UNITED STATES.—During the present year the Pennsylvania Railway Company has purchased and laid down on its various divisions over 20,000 tons of steel rails, and nearly 9000 tons of iron rails. The main track between Philadelphia and Pittsburg is now laid entirely with steel, and the New Jersey division will have no iron rails by next April. The company first began to lay steel rails in 1860, and every year’s experience demonstrates their economy. English rails are quoted at New York at \$48 to \$50 per ton gold; American rails at the works at \$48 to \$50 per ton currency. The anthracite coal trade of Pennsylvania has now become fairly active, with a steadily increasing tonnage. The Schuylkill district is throwing now a very large quantity of

coal upon the markets. The demand is good, and a small advance in prices has taken place this month.

BLAST FURNACES IN THE UNITED STATES.—The "Bulletin" of the American Iron and Steel Association reports the statistics of the blast furnaces for the last three years, as follows—

	1872.	1873.	1874.
No. of furnaces, Jan. 1.	574	615	665
No. of furnaces built during the year	41	50	38
Total number of furnaces Dec. 31.	618	665	701
Out of blast Dec. 31	115	282	336
In blast Dec. 31	503	413	365
Production of pig-iron in net tons.	2,854,558	2,868,278	2,659,413
Pig-iron.			
On hand Jan. 1	Tons 400,000	700,000	700,000
Imports	295,987	154,718	62,165
Production	2,854,558	2,868,278	2,659,413
Total supply	3,855,525	3,722,986	3,420,578
On hand Dec. 31	700,000	700,000	1,000,000
Consumption	Tons 2,850,525	3,022,984	2,450,578

It concludes from this that there are now furnaces enough in this country to supply any probable demand for some years to come, without any future importations; and that, so long as prices enable the most unfavourably situated of these furnaces to make any profit, however small, the home demand will, substantially, be supplied by the home production (except in special brands, in which there will doubtless continue to be importations long after America has become a large exporter of pig-iron).

MINERAL RESOURCES OF NEW ZEALAND.—The Province of Otago has been very carefully prospected by Mr. G. H. F. ULRICH, F.G.S., and in another column of this day's Journal will be found a full abstract of the very interesting report which he has made. The yield of gold has not been large, but the deposits appear well worth development, especially considering the prospect of improvement in depth. At Moke Creek good deposits of copper exist, and are estimated to average 12 per cent. Antimony and cinnabar have been found in the Province, but they do not appear to be worth working. There are abundant deposits of brown and pitch coal, the working of which would be highly advantageous to the Province.

THE IRON AND STEEL INSTITUTE.—The proceedings in connection with the annual provincial meeting of the Iron and Steel Institute will commence in Manchester, on Tuesday, Sept. 7, under the presidency of Mr. Wm. Menelaus. The local committee, of which Mr. Daniel Adamson is chairman, and Messrs. Parkyn and Henry McNeil the hon. secretaries, have already got the arrangements in a forward state. The Council of Owen's College have granted the use of that building for the business meetings, and the place in every respect is admirably adapted for the purpose. On Tuesday the mayors of Manchester and Salford respectively will welcome the members of the Institute, and the remainder of that morning and Wednesday morning will be devoted to the reading and discussion of papers. The following are amongst the number that have already been accepted by the council:—Mr. D. Adamson, "On High Pressure Steam and its Application to Quadruple Engines;" Mr. C. J. Homer, "On the North Staffordshire Mineral Field;" Mr. Charles Wood, "On Blast-Furnace Hearths;" Mr. G. J. Snellus, "On Fire-Clay and other Refractory Materials;" Mr. W. Hackney, "On Designing Ingots Moulds for Steel Rail Ingots," and "On Improvements in the Manufacture of Coke." The paper read by Mr. D. Joy at the London meeting will be brought forward for discussion. On the afternoons of Tuesday and Wednesday various works in the neighbourhood of Manchester will be open for inspection. The two exhibitions of machinery in motion, &c., at the Pomona Gardens and at Cheetah Hill, will be open to members on production of their tickets. On Tuesday evening the local committee will arrange a *conversazione* in the Town Hall, granted by the Mayor for the purpose. On Wednesday evening the members will dine together in the Hulme Town Hall. On Thursday the members will visit works within easy reach of Manchester. One section will take the Hyde Junction works, and will be the guests of Mr. Adamson. Another section will visit Oldham, and a third will go to Bolton, and will inspect works in the respective districts. On Friday the whole day will be devoted to North Staffordshire. It will thus be seen that the arrangements already sketched out indicate a pleasant and successful gathering. Of one thing the Institute may be quite certain—the Manchester members will give a hearty reception to all who are able to be present at the forthcoming meeting.

ENORMOUS SLATE BLOCK.—THE NEW PRINCE OF WALES SLATE COMPANY.—From the subjoined communication from the manager, Mr. John Roberts, under date Aug. 17, it would appear that slabs of enormous dimensions are produced at the quarries of this company, and that the rock is of unusual quality may be inferred from the fact that the blocks are available for slabs from the very surface, and for slates at the depth only of one gallery, and in many cases at only a few yards from the surface. Mr. Roberts states:—"The quantity of rock laid loose by the blast in No. 5 gallery is 624 tons. The top piece, which did not fall down, weighs 412 tons. It is 25 ft. long, 11 ft. in breadth, and 18 ft. deep. All that piece stands on a small loose pillar at one end and 2 ft. of flat joint on the other. We are carrying down the loose slabs to the machine-house."

REPORT FROM CORNWALL.

Aug. 19.—The aspect of affairs has decidedly improved since last week. There has actually been something like a little competition for tin among the smelters, and that is taken to be of more substantial meaning than the mere isolated fact of a small rise in the standard would be. Can it really be that we have seen the worst of the present trial? It is very dangerous to prophecy, but it looks very much if this were so.

There are other indications of hopefulness. The copper standard has recently advanced, and with the large number of highly promising young mines that there are it is urged that the present is a very favourable time to recommence the search for copper, which has been practically abandoned for several years. Great care should be observed in dealing with mines where a very great depth has been reached, and which are practically exhausted. Mines, however, of from 100 to 150 fms. in depth may be fairly considered legitimate speculations, and from such 18,000' worth of copper ores were raised during the last twelve months the mines were worked. The appliances for working such mines have also been wonderfully improved during the last 20 or 30 years. The introduction of wire-rope for drawing purposes is one of great importance, not only enabling ore to be drawn at one-half the former cost, but what is far more important, enabling fully double the quantity to be drawn through a shaft. In several mines where the number of shafts are limited this really means paying costs or not.

St. Just Amalgamated is now hopelessly abandoned, the pulling up of the pitwork having commenced. The company have done all they can to keep it afloat, having used every endeavour several months since to obtain permission from the lords to break through the boundary line existing between the St. Just and the Cape Cornwall Mines, both of these mines being on the same lode, and the best of the tin ground in the St. Just part, reaching as far towards Cape Cornwall as their boundary, where it entered another lord's land. The penalty for breaking this line is 500/-, which the company sought to remove, and to obtain permission to work the Cape Mine by extending the levels from the St. Just Amalgamated into it. At this time the additional capital required to work the both mines as one concern could have been readily found. But the lords would not consent, and the consequence of this policy is that both mines are now virtually stopped, and even if consent could now be obtained it would be too late, as no one would come forward with fresh capital in the present state of the tin market. By the stopping of these mines more than 250 persons are thrown out of employment.

The Royal Cornwall Geological Society has made a fresh issue of transactions after some year's delay. It is a valuable and interesting volume. Among the contributors is Dr. C. Le Neve Foster, who has a paper on Wheal Mary Ann lode now inaccessible, and one on the discovery of that new and rare mineral andrewsite, at Phoenix

Mine. Other contributors include Mr. S. Higgs, F.G.S., now of York Peninsula, and Mr. Whitley.

The Falmouth Docks are doing well. It is proposed to lease the company's graving docks, gridiron, iron warehouse, engine-house, machinery, &c., with the land surrounding the same, to a private company. The granting of a lease of a portion of the Falmouth Docks premises will depend upon the company being able to obtain sufficient funds from the issue of pre-preference stock to pay off their mortgage debts, and to complete the enclosure of the tidal basin. Two ships are now in the dry dock undergoing repairs. Four vessels are loading china-clay, one barque undergoing repair, and one ship discharging a large cargo of guano, about 1500 tons.

We are glad to find that so high an authority as Capt. Teague, at Carn Brea meeting yesterday, endorsed the views which we have expressed concerning the price of tin. He, too, holds that the lowest price has been reached for the present, and that there will speedily be an improvement. We have heretofore pointed out that the tin trade cannot be expected to flourish when general trade is depressed, and agree with him likewise in regarding the present large consumption of metal as an exceedingly satisfactory indication. Yesterday's meetings were decidedly encouraging. Tincroft gave a dividend, if a small one; South Crofty made a slight profit; and if there was a loss in Carn Brea it was easily accounted for. But for the fall in the standard in the quarter there would have been a handsome surplus, and even a slight rise will soon put matters right.

REPORT FROM THE FOREST OF DEAN.

Aug. 18.—Things remain very much as they were at the date of our last report—dullness is the rule and activity the exception throughout the Forest, as far as regards coal and iron. A few of the largest collieries are pretty well employed, and the less extensive ones are still in a condition of comparative stagnation, as up the valley from Lydney, on either side, as far almost as Parkend, the men are not at work half their time at current date, which implies that the demand for coal is of a limited nature, which tells upon trade income; and in respect of the working colliery the slackness must be painfully felt, because half, or less than half, time means a minimum income, and with the extra cost of living such a reduction of wages from loss of time implies very straightened circumstances in the dwellings of workmen. Changing the form of expressing to a metaphor, we should call it a bad season for honey for working bees, and although the drones of Forest Works can live without toll, even they must have feed, and at the cost of coming in honey. Very possibly merchants may have held back somewhat, notwithstanding that this is the season for taking in stocks prior to the rise in prices; but, however we may account for the season continues, in a general sense, a dull one. As the autumn and winter will draw on it is believed that a brisker trade will spring up, which to some extent will undoubtedly be realised; but from the fact that other countries are developing collieries, and contributions have been brought into operation at home for reducing the consumption of fuel, to say nothing about foreign additional collieries having been opened at home, we confess that we are not enthusiastic spectators of such high figures and full trade as ruled two or three years back. Under these circumstances we think that both capitalists and working men would do well to turn their attention, in considerable numbers, to younger countries, where new and extending wants will require to be met by resident workers, capitalists in those young communities. Home, "sweet home," however, has a firm hold of most of our countrymen, so that although a good percentage of adventurous spirits are looking with longing eyes towards the colonies, and tens of thousands are month after month leaving our shores, there need be no fear but the old country will still keep up a sufficiency of population, and some to spare, for a long time to come.

The purchase of the Parkend Iron and Tin Works by Messrs. H. Crawshay and Sons (Mr. E. Crawshay's name being put forth prominently for commercial purposes) continues to be a notable topic of conversation, some hoping, whilst others doubt as to how far the monopoly of work by one firm may prove beneficial or otherwise for the general welfare of the local public. Other changes have taken place, the Flour Mill Colliery, near Bream, having passed into the hands of a Mr. Goutney, who, it is expected, will become a resident near Lydney. As far as we know, the Sewell case remains unsettled, nor does it appear at present when a decision may be given, as most likely it will have to take the ordinary course of the Court of Chancery.

A mining case was tried at Gloucester on Saturday. The plaintiff was Mr. William James, of Bream, owner of the Oakwood Deep Level Iron Mine, and the defendants were Messrs. Greenham and James and others, better known as the "Forest of Dean Iron Company," and owners of the Parkhill Iron Mine. The deep boundary line of the Oakwood Level Iron Mine is defined by the award made by the Commissioners appointed to determine all such matters in 1841, and fully set out in the said award as being as deep as levels will drain from the point where the level adit struck the iron ore measures. This deep boundary line of the Oakwood Deep Level is also made the land boundary line of the Parkhill Iron Mine under the same award, made in 1841, by Mr. Sopwith. The adit level and a part of the level heading itself was driven before 1841, and a large quantity of the bulk of ore got from it. The owners of the deeper mine—Parkhill Iron Mine—came to an agreement with the former owners of the Oakwood Level to work a part of the Parkhill Iron Mine from the said Oakwood Level, and thus the two mines were worked simultaneously, and the ore brought out through the same level.

This arrangement continued until Mr. William James bought the property, but since that time disputes have continually occurred, which, although esteemed trivial by some of the parties concerned, have resulted in litigation, and, as has already been stated, came on for hearing on Saturday last before Mr. Justice Grove. Mr. Hill, Q.C., and Mr. Samer, were for the plaintiff; and Mr. Matthews, Q.C., and Mr. Lawrence, Q.C., instructed by Messrs. Wintle and Maule, solicitors, of Newhaven, were for the defendants. The case was of a very difficult and technical nature, requiring the evidence of scientific persons, and there were present on behalf of the plaintiff Mr. Cooksey, M.E., and some other persons; Mr. H. D. Hoskold, M.E. (late of Cinderford, but now of London), was called in and had charge of the engineering department, supported by Messrs. Huxham and Lawrence, mining engineers, and some other persons.

The plaintiff's counsel stated the case, and put in some plans and sections; but the Judge took exception to some of the counts, and pointed out to the parties that he did not consider it to be a fit case for a jury, and that it would be wise for the parties to adopt some plan by which all disputes might be finally settled. If this cause was gone with it was quite possible questions not now seen would come up which would lead to long and costly litigation. Arbitrations were doubtless expensive things, and where actions could be settled by a jury that was the better plan to adopt. But he really saw no means of this action settling all litigation between the parties unless arbitration was agreed to. He strongly advised the adoption of arbitration, and said the amount of litigation which might follow was appalling. Our system of jurisprudence was not adapted to meet such cases as this, nor did he know of any system that was. After some consultation, the Judge and counsel retired, and the result of their deliberation was represented to the parties interested, and it was agreed to refer the points in dispute to Mr. Dowdeswell, Q.C. The jury was then directed by the Judge to give a nominal verdict for the plaintiff, in order to enable them to go to arbitration. The plaintiff's case included a claim for 3000/-, alleged to have been lost through hindrance on the part of the defendant's mode of working, a loss of 5s. per ton during two years, besides two sums of 100/- and 77/- 10s. expenses necessary before he could satisfactorily work. The date of the arbitration is not yet settled, but it is believed that it will come on some time in October.

As an instance of the extraordinary fluctuation in the coal market during the last two or three years, it may be mentioned that in 1871 the price of coal at Coleford was 7s. 6d. per ton; in 1873 it was 21s. per ton; and this week, at the railway station, the price is 11s. 6d. or 2s. 6d. a ton less than it was a few weeks ago.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Aug. 20.—The competition in pig-iron between local and North Country producers continues very severe, and it is producing very marked consequences in this district. Three more furnaces have been either "damped down" or blown out this week, reducing the total number in operation to 70. Common cinder pig has been very irregular in price, and although quoted 21. 15s. per ton, it is understood to have changed hands in some instances at considerably under that low figure. That any profit can be realised at such prices under existing circumstances of production is out of all question, and to makers of this class of pig-iron the suspension of operations for a time seems to be the only means of escaping loss. For all-mine pigs the demand is fairly steady, and prices are well supported at 41. 10s. for hot-air and 61. for cold-air makes. North Derbyshire pigs have been selling in this district during the week at 3s. 7s. 6d. and Cleveland ditto at 3s. 5s. per ton. The finished iron manufacturers report a somewhat steadier business in the branded qualities, and sheets continue in fairly sustained request, but in other respects this branch of the trade is very flat, notwithstanding that common bars are offering at as low a rate as 8/- per ton. Marked iron continues on the basis of 10/- for bars.

The South Staffordshire Coal Trade shows some improvement this week in the better qualities, and on the Dudley side of the district prices are very steady, on the basis of 11s. per ton for furnace coal. The commoner descriptions are only in moderate demand, and there is continued irregularity in the selling prices.

The report of the Patent Shaft and Axletree Company (Limited) has just been issued:—The directors beg to submit to the shareholders here a statement of accounts and balance-sheet for the year ending June 30, 1875, showing a net profit of 26,509/- 10s. 2d., which, with the sum of 3640/- 5s. 1d. brought forward from last year, makes a total of 30,149/- 10s. 2d., after due provision made

for all bad and doubtful debts. From this sum must be deducted the interim dividend for the half-year ending Dec. 31, at the rate of 10/- per cent. per annum, which amounted to 14,713/-, leaving a balance of 15,396/- 10s. 2d.; and the directors recommend the payment of a dividend at the same rate for the half-year ending June 30, amounting to 14,783/-, carrying forward 553/- 10s. 2d. to next account. The directors consider the results of the year's working to be satisfactory, when the state of trade during that period is taken into account. As will be seen from the profit and loss account, the directors have only divided among themselves a part of the sum voted to them at the last general meeting, having agreed to forego for the present the increased scale of fees in consideration of the reduced dividend. The deputy-chairmanship of the board having become vacant by the death of Mr. Sampson Lloyd, the directors have to announce the appointment of Mr. Thomas Eades Walker, M.P., to the post. Two directors—Mr. T. E. Walker, M.P., and Mr. J. N. Brown—retire by rotation, and, being eligible, offer themselves for re-election. The auditor, Mr. Henry Edmunds, also retires, and offers himself for re-election.

The Gloucester Wagon Company's report is in the following terms:—The directors report that the past financial year has been one of great difficulty and anxiety, owing to the protracted strike in South Wales and Monmouthshire, the effects of which are still being felt by this company. The wagon stock belonging to the company now consists of 12,354 vehicles—5388 sold or deferred payment, 6936 let or hire, six in use by the company, and 24 unemployed. During the past year, in addition to work done for cash payment, 923 vehicles have been built for the company's stock, of which 441 have been sold on deferred payment and 482 have been let or hired. The company have now to repair and maintain 12,405 wagons. The stock of stone and materials has been raised by importers, as well as by the company's officials, and in each case the lowest valuation has been adopted. On referring to the balance-sheet it will be observed that, after providing for the usual reserves and paying an interim dividend for the half-year ending Dec. 31, last, at 10 per cent. per annum, there remains a balance of 34,423/- 10s. 1d., which it is proposed to appropriate as follows:—The payment of a dividend at the rate of 10 per cent. per annum, free of income-tax, 20,937/- 10s.; guarantee fund, 10,018/- 5s. 6d.; balance to next account, 3,467/- 10s. 2d. The reserve funds will then amount to 162,390/- 10s. 2d.

Quotations on the Birmingham Stock Exchange to-day included the following items:—Patent Nut and Bolt Company (Limited), 5/- prem.; Pelsall Coal and Iron, 5 dls.; Sandwell Park Colliery, 3d.; Cannock and Huntington Colliery, 2 prem., buyers; Chilington Iron, 5/- sellers; John Bagnall and Sons, 5/-; Patent Shaft and Axe, 4 prem.; Staffordshire Wheel and Axe, 1/- prem.; Ivy House Colliery, 1 dls.

In the programme of the Manchester meeting of the Iron and Steel Institute one day is set down for a visit to the ironworks and collieries of North Staffordshire. Mr. C. J. Homer, of the Chatterley Iron Company, will read a paper at the Congress on the North Staffordshire Mineral Field.

The North Staffordshire Iron Trade is, on the whole, a trifle better than than we were able to report a week ago, a few orders marked for immediate delivery having come to hand within the last few days. Marked bars are quoted 9/- per ton, but good specifications have been placed at slightly under that figure. The pig-iron trade is not much improved, buyers for the most part restricting their operations to urgent requirements. Fuel is in plentiful supply, and prices are weak.

The ironfoundries in the Black Country are in very well sustained operation, orders of considerable importance being in course of execution for gas and water mains, mill gearing, and other descriptions of castings of the heavier class.

NORTH STAFFORDSHIRE MINING INSTITUTE.—The adjourned monthly meeting of the members of this Institute was held at Stoke, on Monday, when Mr. C. J. Homer presided. The following new members were elected:—Mr. Charles L. Allport, engineer, Atlas Works, Sheffield; Mr. George Bond, colliery engineer, Chesterfield; Mr. Louis John Cartwright, surveyor, Chatterley, Tunstall; Mr. Fred. M. Chadwick, analyst to coal and iron mines, Chatterley Works, Tunstall; Mr. Julien Deby, civil engineer, 6, Rue Quatre, Bruxelles, Belgium; Mr. James Marshall, engineer, Chatterley Works, Tunstall; Mr. Henry F. Rose, ironmaster, West Bromwich; Mr. George J. Suelas, Associate Royal School of Mines, also chief engineer to iron and steel works, Workington.

The Chairman alluded to the recent visit of the South Staffordshire and East Worcestershire Institute to the district, and spoke of the fraternal feeling manifested by the engineers of the north and south of the county, whose object was to adopt all improvements with a view to raising coal at the least possible cost and least possible liability to accident. He was sure that if they should again have a visit from their South Staffordshire friends, or if they themselves visited South Staffordshire, the same good feeling would be manifested.—A conversation took place as to the next excursion of the North Staffordshire Institute. Lincoln and Cannock were mentioned. The President intimated that he was authorised by the Duke of Sutherland to state that his Grace would be glad to welcome them if they would pay a visit to his works in Sutherlandshire. Mr. Haines was instructed to issue circular to ascertain how many members would be willing to go if the excursion were arranged to take place in September.

The President read a paper by Messrs. M. and I. Landau—"Miners' Safety Lights and Lamps"—which concluded with a strong recommendation of a lamp of their own invention, which was represented to have the following advantages:—First, it was a perfect safeguard against explosions; secondly, it gave greater brilliancy of light; thirdly, it was in no way affected by the strongest current of air; and fourthly, it was impossible for the miner to tamper with it with impunity.—Mr. J. Brown, of Hanley, on behalf of Messrs. Landau, exhibited one of the lamps, and explained one way in which it was superior to other lamps—that by an arrangement at the bottom of the

one of the chief concerns in the kingdom—states that the year's trade has brought with it considerable anxiety, and was marked by continually increasing depression. The year's profits, nevertheless, have been 56,000*l.*, out of which a dividend at the rate of 15 per cent. is recommended, besides increasing the reserve fund to 100,000*l.* Thirty acres of freehold land adjoining the works have been purchased. Sinkings at Newstead are progressing, and the works at Langwith sinkings will be begun at Glasswell next spring, and negotiations are going on for the acquirement of oolitic ironstone.

During the last month an increased tonnage of coal has been sent to London by the various lines of railway as compared with the two previous months. This is somewhat unusual. In a great measure it is the result of the low prices of coal at the present time, and the desire of colliery owners to keep their pits working, even at a sacrifice of profit. The traffic from Lancashire during the last three months has been well maintained. The following is the tonnage carried during the last three months by the various lines of railway having termini in the metropolis:—

	May.	June.	July.
Midland	Tons 109,982	122,230	131,122
London and North-Western	78,196	66,703	76,611
Great Northern	74,983	62,164	63,755
Great Eastern	63,160	58,076	53,714
Great Western	38,414	33,912	55,761
London and South-Western	284	1,816	4,382
South-Eastern, &c.	1,027	1,277	1,037
Total	Tons 356,193	323,178	383,382

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week the market has been neglected owing to the holiday season, the general tendency of prices has, therefore, been lower. In shares of Iron and Coal concerns, the reductions comprise $\frac{1}{4}$ on Bolckow, Vaughan "A"; $\frac{2}{3}$. 6d. on Marcella; 6d. on Monkland ordinary; and $\frac{1}{4}$ on Shott's Iron new shares. On the other hand, Omoa and Cleland, Cairnitable, and both descriptions of Benhar, have improved slightly. New Sharston Collieries are 5 to $\frac{1}{2}$; South Cleveland Ironworks, 2*½* to 3; and United Bituminous Collieries, $\frac{1}{2}$ to $\frac{1}{2}$. In shares of Copper concerns, Canadian Pyrites are 1*½* down; Panulcillo, $\frac{1}{2}$; Tharsis, 1*½*; and ditto new shares, $\frac{1}{2}$. Yorke Peninsula are firmer at $\frac{1}{2}$ to $\frac{1}{2}$; and Huntington is 1*½* up. Bedford United is $\frac{1}{2}$ to $\frac{1}{2}$; Drake Walls, $\frac{1}{2}$ to $\frac{1}{2}$; East Caradon, $\frac{1}{2}$ to 1*½*; Great Laxey, about 1*½*; Great West Van, $\frac{1}{2}$ to $\frac{1}{2}$; Gunnislake Clitters, 1*½* to 1*¾*; and New Pembroke, $\frac{1}{2}$ to $\frac{1}{2}$. In shares of Gold and Silver mines, Flagstaff is fully $\frac{1}{2}$ lower; Richmond, $\frac{1}{2}$; and Colorado Terrible, $\frac{1}{2}$. Australasian Mines Investment is $\frac{1}{2}$ to $\frac{1}{2}$; Battle Mountain 1 to 3; Javali, 10*½* to 12*½*; Rica, 3*½* to 5*½*. Oil shares unaltered. In Miscellaneous, Peruvian Nitrate has improved $\frac{1}{2}$; and both descriptions of Scottish Wagon shares, $\frac{1}{2}$. Native Guano is 1 down. Antro Iron Ore (5*½* shares, 4*½* paid) are about 1*½*. The Mersey Steel and Iron Company (Limited) have recommended a dividend of 5*½* per share, making, with the 2*½*. 6d. per share formerly paid, 7*½* per cent. for the year. A detailed list of the several days' business follows:—

On THURSDAY last a moderate business was transacted. Arniston, 6*½* to 6*¾*. Benhar (all paid) done at 10*½*, closing 10*½* to 10*¾*; new (5*½* paid) shares wanted at 5*½* to 6*¾*. Canadian Copper Pyrites done at 37*½*. 9d., closing 37*½*. 6d., to 38*½*. Flagstaff done at 1*½*. Huntington opened at 3*½*, but gradually improved to 4*½*, closing 4*½*. 6d. to 4*½*. Marke Valley, 2 to 2*½*. Omoa and Cleland lower, at 1*¾* to 1*½*; the annual ordinary general meeting of the shareholders of this company is to be held on the 27th inst. The report then to be submitted states that owing to the unremunerative character of their business during the past year the directors cannot hope to declare a dividend, but they have good hope for the future. Richmond done at 12*½*. Tharsis opened at 20*½*, but declined to 19*½*, from which a rise took place to 19*¾*, the closing prices being 19*½* 11*½*ths., to 19*¾* 13*½*ths.; new shares 13 to 13*½*. Scottish Wagon (all-paid), 10*½* to 11; new (4*½* paid) shares done at 1*½*.

On FRIDAY the business done was very small. Benhar new (5*½* paid) shares done at 10*¾*, with buyers over. Bolckow, Vaughan, A, done at 49*½*, closing 49*½* to 50. Canadian Copper Pyrites done at 37*½*. 6d., closing 37*½*. 3*½*. East Caradon, 3*½* to 1. Huntington done at 4*½*, closing 4*½*. 2*½*. Javali, 3*½* to 5*½*. Lochore and Capledene, 3*½* to 5*½*. Omoa and Cleland better at 1*½* to 2, business done, closing 4*½*. to 4*½*. Tharsis done from 19*¾* to 19*½*, closing 19 to 19*½*. Scottish Wagon (all-paid), 10*½* to 11; new (4*½* paid) shares done at 4*½*, closing 4*½* to 4*½*.

On SATURDAY the market continued idle. Arniston, 6*½* to 6*¾*. Benhar (all paid) done at 10*¾*, closing 10*¾* to 10*½*; new (5*½* paid) shares, 10*½* to 11*½*. Canadian Copper Pyrites, 3*½* to 3*½*. Glasgow Caradon remain at 2*½*; the next sale is computed 24*½* tons for the 19th inst. Last month's sale was 24*½* tons, while the sale at this time last year was 23*½* tons. Great West Van, 3*½* to 4*½*. Marcella done at 4*½*, closing 3*¾* to 5*½*. Nant-y-Glo and Blaina, preferred, firmer, at 4*½* to 4*¾*. Dundas Wheal Phoenix Tin (Limited), 2*½*. 1*½* to 2*½*. Glasgow Caradon Copper Mining (Lim.), 2*½*. 1*½* to 2*½*. Ditto New. 1*½* to 2*½*. Huntington Copper and Sulphur (Lim.), 2*½*. 1*½* to 2*½*. Kapuni Mining (Limited), 3*½*. 1*½* to 2*½*. Panulcillo Copper (Limited), 2*½*. 1*½* to 2*½*. Russian Copper (Limited), 2*½*. 1*½* to 2*½*. Tharsis Copper and Sulphur (Limited), 18*½* to 19*½*. Ditto New. 1*½* to 2*½*. Yorke Peninsula Mining (Limited), 10*½* to 11*½*. For share.

Last day for this account August 27; settling day, August 31.

NOTE.—The above list of mines and auxiliary associations is as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in this list, they will be good enough to communicate the name of the company with any other particulars as full as possible.

J. RAY MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, Aug. 19.

TRADE OF THE TYNE AND WEAR.

Aug. 18.—The Coal Trade, on the whole, is very dull, ample supplies of coals are produced, and many of the works on both those rivers have been laid off some days during the past week. The only coal producing any price at which it is possible to make a profit at present is household; there appears to be a tacit understanding or impression that this coal is to be kept up in price, but for all other sorts, especially manufacturing coal, the competition is so keen for orders that ruinous prices are accepted. The demand for Durham coke continues to fall off not only from the Cleveland district, where a number of furnaces have been blown out, but also from Lancashire and Cumberland, where the hematite iron trade is very dull; as each blast-furnace consumes on an average 900 tons of coal the dull state of the iron trade has a direct bad effect on the coal trade. The men generally are working steadily, and there is a plentiful supply of men, indeed numbers of them are now in search of work both in North and South Durham.

There is a better feeling in the Iron Trade. The demand for pig metal has increased considerably, and as stocks are very low there is more confidence, and prices have improved a little. There is a strong demand for foundry metal, most of the engine works and foundries being well supplied with orders. Some of them are working a good deal of overtime. Quotations are now 50*lb.* for No. 3, early delivery, and there is little abatement for the remainder of the summer. The failure of the Stockton Rail Mill Company and Messrs. Shaw and Thompson has revived the uneasiness which was felt lately. There is no real improvement in the rail trade, but for bars and plates there is a slightly improved demand. Rails are 7*lb.*; ship plates, 8*lb.* 10*lb.*; puddled bars, 5*lb.* to 5*lb.* 2*½*. 6*lb.* The Coal and Coke Trades are very inactive in South Durham. Best house coal, 13*lb.* to 14*lb.* at the pits; coke, 12*lb.* to 14*lb.*

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Aug. 18.—There is no little satisfaction in finding that the past week has not dissipated the hopes of improvement in the trade, but rather that the indications of a revival in trade are more noticeable. There is a larger quantity of iron cleared to some of the foreign markets, and consequently there is more activity at the establishments, but as yet it must be confessed that the increase in the demand is mainly prospective. The probability is that there will be no material increase in actual transactions for some time yet, but it is believed with some confidence that before the end of the year there will be better demand for some of the heavier descriptions of iron, and that some large rail contracts will be given out. If makers' hopes are realized it will not be long before the mills will again be set in motion for a season of activity. Naturally there is greater firmness in prices as a consequence of these improved prospects, but probably it will not stay quotations being further reduced. The foundries are all in good employ. The wagon companies have done well during the last half-year. The Bristol and South Wales pays a dividend at the rate of 10 per cent. per annum, and a bonus of 2*½* per cent. The Gloucester Company also makes a distribution at the rate of 10 per cent. per annum, and the Swansea 4*½* per cent. The latter company has had considerable difficulties to contend with. In the tin-plate trade the same dull state of things prevails. The strike at the College Ironworks, near Cardiff, is at an end, the men having accepted the 10 per cent. reduction.

In regard to the Coal Trade the most encouraging accounts are still current. The demand keeps up remarkably well, and the clearances to the various foreign markets continue considerably above the average. Prices do not, however, admit of much profit after the whole of the cost of production is covered. The reports of the various railway and colliery companies show only too clearly to what an extent all suffered during the five-months strike and lock-out, but the receipts have rapidly increased since. The Taff Vale Company only pays a dividend at the rate of 5 per cent. per annum as against the usual 10 per cent.; and the Monmouthshire 2 per cent.

COAL AND IRON COMPANIES.—South Wales (17*lb.* paid), 3 to 4 prem.; Cardiff and Swansea (8*lb.* paid), 4*½* to 5*½*; West Mostyn 12 per cent. preference (5*lb.* paid), par to 5*lb.* ex div.; Richards and Company (6*lb.* paid), par to 5*lb.* ex div.; Bilson and Crump (10*lb.* paid), 5*lb.* to 5*lb.* 2*½* prem. ex div.; Tredegar (12*lb.* paid), par to 5*lb.* prem.; ditto (2*½* shares), 2*½* to 2*½*.

PROPOSED INSTITUTION OF MARINE ENGINEERS.—At a meeting of the council of the Associate of Marine Engineers, on Aug. 12 (Mr. N. P. Burgh, C.E., in the chair), it was resolved to establish an Institution of Marine Engineers (with temporary offices at New London-street, Fenchurch-street), to watch over and protect the in-

terest and welfare of all concerned; to diffuse sound and reliable information by the discussion of practical subjects, and generally to elevate and improve the condition of the Marine Engineer afloat. The Institution is to give guarded attention to the daily increasing tonnage and dimension of hull, horse-power, and high-pressure steam, all of which necessitate that the Marine Engineer must be scientifically informed on the present and future compound engines and boilers. With the steamship owners, Board of Trade Engineer Surveyors, and the consulting marine engineers throughout the kingdom are to be communicated and their co-operation requested, and they are to be urged to contribute to the establishment of such an Institution, to become members thereof, and in every way to promote its objects.

COAL MINES REGULATION ACT, 1872.

CERTIFICATES OF COMPETENCY.

As a knowledge of the nature of the questions asked at the Examinations for Certificates of Competency is desirable to candidates in order to enable them to avoid waste of time in studying subjects not regarded as essential, the questions set by the Board for Examinations for the North and East Lancashire District at the last three examinations are subjoined:—

INSTRUCTIONS TO CANDIDATES.

1.—During the examination the candidate must not speak to any other candidate nor hold any communication with him, nor must he leave the room until he has completed his questions, nor then without the permission of the secretary.

2.—Answers must be written on the paper supplied, and the answer must be numbered to correspond with the question. The candidate may answer any question in the order he may prefer. Answers must be written on one side of the paper only. Each sheet must be signed at the foot with the name of the candidate. The candidate is not required to answer all the questions, but he must show a competent knowledge in each subject.

3.—The paper of questions must be returned with the answers, and no candidate is allowed to take away with him a copy of the questions or any of them.

PRELIMINARY.

State your Name
Age
Address

QUESTIONS—JUNE, 1873.

1.—SHAFTS.

1.—Describe the operation of sinking and securing a shaft through a surface of quicksand 10 yards in depth.

2.—What description of conductors is used in shafts?

3.—What is the approximate weight of a round hempen rope, 250 yards in length, and 8 in. in circumference?

4.—By what number of short chains ought a circular cradle or flying scaffold to be attached to the bottom end of a capstan rope?

5.—Describe the process of laying a metal curb to support a column of metal tubing.

6.—Describe the process of putting in metal tubing.

7.—How would you send metal tubing down a shaft?

2.—VENTILATION.

8.—What is fire-damp, and by what other names is it called?

9.—What is atmospheric air?

10.—What is carbonic acid, and by what other names is it called?

11.—What are approximately the relative weights of each, that of air being 1*lb.*

12.—When is fire-damp most explosive; and, should it continue to burn in the lamp after drawing down the wick, how would you act?

13.—Describe the Stephenson, the Clanny, and the Davy lamp, and say which you consider the safest, and why.

14.—What means are in use to produce ventilation in mines?

15.—Ventilate the workings shown by the accompanying plan, without using any air-doors, except those shown; the drawing roads are distinguished by dotted lines.

16.—What is meant by "long work"? Show this by a sketch.

17.—What is meant by "pillar and stall" work? Show this by a sketch.

18.—Describe the process of boring against an old working or waste, and state what precautions you would take.

19.—The roof of a roadway is very destructive of timber, and is almost impossible to support; what course would you try?

20.—In driving the lowest levels in a seam of coal dipping to the south of 1*in* to 6*ft.*, an upthrow fault of 15 yards is met with; what would do to recover the coal? If it were tunnelled out, what would be the length of the tunnel?

4.—GUNPOWDER.

21.—What is gunpowder made of?

22.—How do you make a cartridge?

23.—Describe the material you would use in tamping?

24.—What would you do in case of a missed shot?

5.—MACHINERY.

25.—What is the difference between a condensing and a non-condensing engine?

26.—What is the principle of the Cornish pumping-engine?

27.—What quantity of water is lifted per minute by a bucket-pump, the diameter of the working barrel being 14*in.*, the length of stroke 7*ft.*, and the number of strokes per minute 6*½*²?

28.—The water in a boiler has become dangerously low; what would you do?

29.—Describe the method of applying a balance to pit-ropes.

THE MINING JOURNAL.

17.—What is a furnace, a dumb drift, and an air crossing? Show by sketch where and how each is applied.
 18.—What quantity of water in gallons will a tank contain, the dimensions being 9 ft. by 8 ft. by 4 ft. 6 in. there being 64 gallons to a cubic foot?
 19.—What is the use of a barometer about a mine?
 20.—What is the water gauge used in mines, and what is its use?
 21.—What is an anemometer?

NEW SIGNALLING INSTRUMENT.—Lieut. PARROTT, of the New South Wales Volunteer Engineers, has invented an instrument which he calls "the sematope," which promises to become very useful in army signalling, inasmuch as it is claimed for that, under moderately favourable conditions of the atmosphere, messages may be transmitted with facility a distance of 50 miles. The instrument consists of an adaptation of and improvement on the heliotrope, invented by Gauss, the German mathematician, in 1821, and the heliotrope of Capt. Drummond, which was used with great success in the triangulation of Great Britain. The sematope consists of a mirror, the reflecting surface of which is an arc of 45°, whose versed sine is .61. The object of this curve is to meet the difficulty arising from the apparent motion of the sun, which is constantly changing the direction of the reflected rays from the surface of the mirror. The effect of this curve is to disperse the rays so much as will materially increase the length of time during which the flashes can be made without adjustment, and at the same time without reducing to any serious degree the brilliancy of the light. In order to prevent any vibratory movement, and so impair the correctness of the signals, the instrument is fixed on a heavy cast-iron base, around the top of which the mirror is made to revolve. Another feature peculiar to the instrument is the lens tube for directing the rays of light, which has been so arranged as to work independently of the mirror. A moveable cover is also provided for the mirror, by which means flashes of light may be shown in such a manner as to transmit messages by a similar system to the Morse system of telegraphing—a combination of long and short flashes. Several trials of the new instruments have been made, and messages were successfully transmitted long distances.

NEW FILTERING AND DEODORISING MATERIAL.—The features of novelty in the invention of Messrs. WEARE and ISHWOOD, of Manchester, consist in the production of an improved carbonaceous material by mixing clay with sawdust, clinkers, and refuse from furnaces, together with tanners' waste or the nuts used by tanners, and charring the mixture in an apparatus consisting of three, five, seven, or more cylinders revolving in or over a furnace, and arranged in the case (say) of three, with two small upper cylinders and one large lower cylinder. The material is fed into the top cylinder, and after being partially carbonised passes through suitable hoppers to the lower one, all the extremities of these cylinders being fitted with covers to obtain ready access to the interior.

DRILLING IN METAL.—The invention of Mr. E. ENOCH, of Hull, relates to portable machinery or apparatus which is specially adapted for drilling or boring holes in the rails of permanent way, the flanges of cylinders, valves, pipes, or columns, but which is also applicable to a variety of general work; and it consists of an improved combination of ratchet brace or other motor for turning a drill, with a clamp or fixture for securing it to the work to be operated upon, whereby the weight and bulk of the apparatus are diminished, great simplicity in attaching it to or removing it from the article to be drilled is secured, and firmness and rigid resistance to the pressure required for drilling, with other advantages, are obtained.

TREATING ORES AND MINERALS.—The invention of Mr. B. TANNER, F.C.S., of Dublin, consists in the treatment of ores and minerals which contain zinc, lead, copper, silver, gold, iron, and sulphur, and of which the blue stone found in the Isle of Anglesey may be taken as an example. The chief advantage obtained is the separation of zinc and lead from the ore or mineral. The ore or mineral is first reduced to a state of fine division, and treated with hydrochloric or sulphuric acid, or with other chlorides or sulphates capable of bringing the zinc and lead into soluble condition. The solution is then submitted to a series of decompositions and precipitations for the separation of the metals contained therein.

IMPROVEMENTS IN ELECTRIC APPARATUS.—All batteries hitherto constructed, especially those which have to be transported, have the disadvantage that when they were charged they could not be hermetically closed, and that when the elements had to be lifted out a complicated mechanism was necessary. If such batteries were to be transported for some distance the several parts of them and the acid had to be packed in separate vessels. Elements that remain filled during the time when they are not employed consume metals and acids uselessly, and are readily spoiled. All these disadvantages are, it is claimed, avoided by an apparatus invented by Mr. JOSEPH LEITER, of Vienna, but which his patent agents do not describe.

MOTIVE POWER FOR WAVES.—The invention of Messrs. DREWELL and TOWER, of Moreton, Essex, consists of an improved apparatus for utilising the motion imparted to a ship or other floating body by waves as a means for obtaining motive power. A ship or other floating body has imparted to it by waves a combined horizontal and vertical oscillation, which combined movement results in the floating body moving in an approximately circular path in a vertical plane, and consequently causes it or any object placed on it to be acted on by a centrifugal force.

IMPROVED RAILWAY BRAKES.—According to the invention of Mr. W. H. STOKES, of Birmingham, each axle of the carriage has two discs upon it which bear respectively against the faces or tyres of the wheels. The said discs are capable of a slight sliding motion on the axle, but are incapable of a rotatory motion. On the underside of the carriage arms or levers are jointed. These arms or levers turn in a horizontal plane, and are connected at their inner ends to a sliding rod extending under the middle of the carriage. The outer ends of the arms or levers are provided with two strong brake blocks, one on one side and the other on the other side of the axle. When the sliding rod is pushed home in either direction it gives motion to the arms or levers, and thereby causes the brake blocks on one or other side to act upon the discs, and thereby to bring the wheels quickly to rest. The arrangement described is applied to each pair of wheels of the carriage, and by connecting the ends of the sliding rods together in making up a train the guard can from his van simultaneously apply the brake power to all the wheels of the train.

**BRYDON AND DAVIDSON,
ENGINEERS,**

WHITEHAVEN.

IRON AND BRASS FOUNDERS.

MAKERS of all kinds of BOILERS; PUMPING, WINDING, and HAULING
ENGINES, and MINING MACHINERY generally.AIR COMPRESSORS, CRANES, CRAB WINCHES, MORTAR MILLS, PUMP
PIPES, &c.

CASTINGS OF ALL KINDS.

LONGDEN'S LIST.**WANTED:**—
NON-CUPREOUS PYRITES.
ANTIMONY ORE—good.
MANGANESE—Ready for shipment.**FOR SALE:**—
SILVER-LEAD SETT.
1400 tons of BLENDE, containing SILVER.

LARGE LOT of NICKEL ORE, rich also for COBALT.

HENRY LONGDEN, MINING EXPERT,
18, COLEMAN STREET, LONDON, E.C.J. FLETCHER PAGEN,
CHAPEL HEYS, NEAR BODMIN,

BUYER of GOOD QUALITY CORNISH or other IRON ORES.

FOR SALE, SEVERAL VALUABLE IRON MINES, on easy terms, to bona
fide investors. Full particulars on application.An Iron Mine required less capital for development than any other Mine, and if
properly managed is a permanent source of profit.**THE ROCK-BORING CONTRACT COMPANY.**

DARLINGTON'S PATENT ROCK-BORING MACHINERY.

OFFICES, 2, COLEMAN STREET BUILDINGS, MOORGATE
STREET, LONDON.FOR TUNNELLING, DRIVING LEVELS, CROSS-CUTS, AND
SINKING SHAFTS.**FOR SALE, TWO GOING MINES, &c., VALUABLE MINERAL
LEASES of ESTATES, near Oughterard, in the county of Galway, by
PRIVATE BARGAIN, together with STEAM ENGINE, WATER WHEEL,
PLANT, and WHOLE MACHINERY, in complete working order.**Within the past few months several tons of excellent lead and copper ores have
been raised in the immediate vicinity of one of the shafts, and several hundreds of
tons have been taken from the other shaft.Capt. FLOYD, Wellfield, Oughterard, will show the ground, and give explanations
as to the nature and extent of past operations. All other particulars will be fur-
nished by, and offers may be lodged with, the subscriber, on or before the 24th day
of August next.JOHN BAIRNSFATHERS, Hamilton, N.B.
29th July, 1875.**PORTABLE STEAM ENGINE FOR SALE, 35-horse power,
with link motion reversing gear; also an 18-horse, both with or without
pit winding and pumping gear.****FOR SALE, a new 6 ft. pan MORTAR MILL, and a good second-
hand 6 horse power PORTABLE STEAM ENGINE. Price of both, £145.**

BARROWS AND STEWART, ENGINEERS, BANBURY.

**CONDENSING AND NON-CONDENSING HORIZONTAL
STEAM ENGINES, of the highest class, at low prices.
PUMPING AND WINDING ENGINES. First-class references.**ENGINEER'S TOOLS of all kinds, unrivalled for arrangement and general
usefulness, at low prices. Inspectors invited.

POLLOCK AND MACNAB,

BRITANNIA IRONWORKS, HYDE, NEAR MANCHESTER.

CUMBERLAND.**THE ELLEN IRON AND STEEL WORKS, MARYPORT,
FOR SALE.****M**R. C. P. HARDY WILL SELL, BY AUCTION, at the County Hotel, Carlisle, on Friday, the 3rd September, 1875, at Three o'clock in the afternoon, the valuable IRON and STEEL WORKS, situate at Maryport, in the county of Cumberland, known as the ELLEN WORKS, recently in the occupation of the Ellen Iron and Steel Company.

The works are of recent construction, and include powerful and well-adapted STEAM ENGINES, six egg-ended and one double tube boiler, twelve puddling furnaces, one ball and four mill furnaces, two steam hammers, forge and mill trains, donkey and special pumps, large and small shears, with punching machinery, adapted roll turning lathe, and saw and engines, complete, shafting and driving gear, weighing machine, steel rails, and other fixed plant.

The WORKS are FREEHOLD, subject to the payment of yearly ground rents, amounting together to £59 9s. 10d., and comprise over 7000 square yards. They adjoin the Whitehaven Junction Railway, from which there is a siding, and are at a very short distance from the dock at Maryport.

To ironmasters and capitalists, the opportunity for securing this valuable property is a highly advantageous one.

Further particulars, and an order to view the works, may be obtained at the offices of Mr. E. HOUGH, Solicitor, 34, Fisher-street, Carlisle.

Carlisle, 19th August, 1875.

NORTH WALES.**VALUABLE LEAD MINES.****T**O BE SOLD, BY AUCTION, by Order of the Liquidator of the Flintshire Lead Mining Company (LIMITED), by MESSRS. DAVIS AND SHOEMITH, at the Star Hotel, Mold, in the county of Flint, on Wednesday, the 25th day of August instant, at Four o'clock in the afternoon, subject to the conditions of sale then and there produced:—

ALL THOSE MINES, VEINS, and LODGES OF LEAD and COPPER ORES, and OTHER MINERALS, lying under about 350 acres, situate at FROU, BRYNGOLEN, ARDDYNEWENT, and NERQUIS, near MOLD, in the county of FLINT, together with THE STEAM ENGINES, BOILERS, PUMPS, SHAFTS, and MACHINERY now working the said mines, consisting of—

ONE PAIR of 18 in. CYLINDER PUMPING ENGINES, with multiplying gear.

ONE 12 in. WINDING ENGINE, with multiplying gear.

ONE DONKEY ENGINE, and one small WINDING ENGINE, with BOILER.

TWO 36 ft. STEAM BOILERS, 6 ft. 6 in. diameter.

A capital pit head, and 130 yards of 15 in. and 116 yards of 18 in. pumps, faced; 3 in. working barrels, and 3 18 in. slack pieces; 140 yards of pitch pine bucket rods, with ears, in good working order; 2 18 in. slide sinking windbores, with stuffing boxes and glands; large cistern for 2 plungers, and 1 for bucket, with bearers, &c.; 250 yards of flat wire rope, and cage buckets; one double purchase winch, and a quantity of chain; capstan, and 180 yards of 10 in. rope; carpenters' tools, smiths' shop, saw shed, offices, and stables.

The right to work the mines is granted by four several leases, dated respectively the 24th March, 1865, the 19th September, 1865, the 21st May, 1867, and the 22nd May, 1873. The first-mentioned lease is for a term of 40 years, from the 25th March, 1866, and the remainder of the leases are each for a term of 21 years, commencing respectively on the 18th September, 1865, the 2nd March, 1866, and the 26th March, 1873. The last-mentioned lease of 90 A. 1 R. and 35 P., subject to a dead rent of £20, merging in royalties, and subject to a surface damage rent, and the remaining leases are granted subject to royalties and surface damage rents only.

The engine shaft is sunk 144 yards from the surface, and calculated to be near the mineral-bearing ground.

From the fact that the proprietors of adjoining lead mines have made very large profits by working the same, the mines now offered for sale are worthy of the attention of capitalists and speculators.

Further particulars, and a detailed description of the plant and machinery, may be obtained on application to the Liquidator, JOHN CLAY, Accountant, Halifax; or to the Captain at the Mines, THOS. MINERS; or to the Auctioneer; or to FRANCIS JURE, Solicitor, Halifax.—Halifax, 10th August, 1875.

BLENCOWE MINE, ST. STEPHENS IN-BRANWELL, CORNWALL.

To BE SOLD, BY PUBLIC AUCTION, BY MR. W. J. JOHNS, on Thursday, the 2nd day of September next, at Eleven o'clock in the forenoon, at the Blencowe Mine, in the parish of St. Stephens-in-Branwell, in the county of Cornwall, subject to such conditions as shall be then and there produced, in One or more Lot or Lots, the WHOLE of the VALUABLE and EXTENSIVE MINING PLANT, MACHINERY, MATERIALS, & EFFECTS, Now being within and upon the said Mine, and comprising the following:—

70 in. CYLINDER PUMPING ENGINE, 12 by 10 1/2 ft. stroke, with first piece rod and balance bob, and TWO BOILERS, shears, with 2 shives.

36 in. STAMPING ENGINE, 9 ft. stroke, with BOILER and fly-wheel, 2 axes with 28 heads, lifters and frames, 1 axle for 16 heads, with heads, &c., not erected.

18 in. STEAM WHIM, 4 ft. stroke, with ONE BOILER and fly-wheel, wood cage, wire rope and chain, and a variety of other articles and effects in general use in mines.

The mine having been worked only about four years, the above materials are in excellent condition, and being situate about two miles from the Grampound Road Station on the Cornwall Railway, unusual facilities for removal are afforded.

To view the same, apply to Captain TREDDINICK, on the Mine; and for further particulars, to the Auctioneer; or to Messrs. SMITH and PAUL, Solicitors, Truro; or to Mr. J. T. TREVENA, Solicitor, Redruth.

Dated 18th August, 1875.

**GENERAL MINING COMPANY FOR IRELAND
(LIMITED). IN LIQUIDATION.****T**HE VALUABLE FREEHOLD AND LEASEHOLD MINERAL and OTHER INTERESTS, and the EXTENSIVE MINING and MANUFACTURING MACHINERY, PLANT, and BUILDINGS, of the GENERAL MINING COMPANY FOR IRELAND (LIMITED), situate at and in the neighbourhood of SILVERMINES, in the county of TIPPERARY, within five miles of the Nenagh Station of the Great Southern and Western Railway, and within eight of the Birdhill Station on the Killaloe Branch of the Waterford and Limerick Railway System, TO BE SOLD, BY AUCTION, at Silvermines, on Wednesday, the 29th day of September, 1875, and succeeding days, commencing each day at noon precisely.

The mineral sets extend over about 2000 acres, and include deposits of calamine (carbonate of zinc), silver-lead, blende, copper, sulphur, and fire-clay, and are held partly in fee and partly under terminable leases; all free from dead rents, and some free from royalty, and others subject to moderate royalties, with exceptionally favourable conditions for working.

The manufacturing plant comprises everything necessary for the making of zinc dioxide direct from the calamine ore, which manufacture was successfully carried on by the General Mining Company.

The mining buildings, plant, and machinery include every requisite for carrying on extensive operations, and they are now in good working order.

Detailed particulars of the lots, with lists of the buildings, plant, and machinery, and the conditions of sale can be had from the undersigned, who will be prepared to receive private offers up to within one week of the day of sale:—D. and T. FITZ-GERALD, Solicitors for the Liquidators, 20, St. Andrew's-street, Dublin; L. STUDERT, LL.D., THOMAS BAKER, Liquidators, 58, Amiens-street, Dublin.

HENDON SPELTER WORKS COMPANY.

TO CAPITALISTS, PROMOTERS OF PUBLIC COMPANIES, & OTHERS.

FOR SALE, in consequence of the Death of the late Senior Partner, the SPELTER WORKS, situate at Hendon, in the borough of Sunderland, in the county of Durham, now being carried on under the style of "THE HENDON SPELTER COMPANY."

The works are situated within one mile of the well-known docks of the port of Sunderland, and adjoining the Hartlepool Branch of the North Eastern Railway, with which they are connected by high and low level sidings, and thereby placed in communication with all parts of the United Kingdom. Their position, within easy distance of both the ports of Newcastle and Sunderland, is very advantageous for the cheap importation of raw material, as also the forwarding of the manufactured article either by land or sea.

The ground on which the works are built could be either bought out or sold on a yearly perpetual ground rent, and any quantity under 20 acres could be included in the sale.

Being situated in the midst of the Durham Coal Field fuel of the best description can be obtained at a cost below almost any other part of the United Kingdom.

There are 19 workmen's cottages, which could be sold with the works.

The works contain 24 zinc furnaces, capable of producing 70 tons of metal a week, as also calciners, potlofts, machinery, blacksmiths' and joiners' shops, &c., of sufficient capacity for a much larger number. The works could, therefore, be doubled at a comparatively small cost.

The quality of the metal made at these works is well known, and it, therefore, commands a ready sale at the highest prices.

Attached to the high level sidings are large depots for coal, ore, &c.

The goodwill would, of course, go with the works, and they will be sold subject to all stock being taken at a fair market value.

The purchaser can also have the option of buying the CALCINING WORKS and VALUABLE MINES in SPAIN, thus allowing of the economical and regular supply of the raw material, and saving the mineowners' and merchants' profits.

As the ore from the South of Spain generally comes as ballast for ships laden with esparto, it has been brought for this company at an average cost of 7s. per ton, sometimes as low as 4s. 6d.

Further particulars can be had on application to the company.

IN VOLUNTARY LIQUIDATION UNDER THE COMPANIES ACT, 1862.

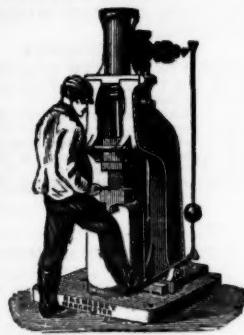
THE NEW LLANGYNOG LEAD MINING COMPANY (LIMITED).**T**o BE SOLD, BY PRIVATE TREATY, ALL the BENEFICIAL INTEREST of the New Llangynog Lead Mining Company (LIMITED) in the Llangynog LEAD MINES, comprising all the valuable, productive, and extensive veins, veins, beds of lead, ore of lead, and other metals and minerals known collectively as "the Llangynog Lead Mines, and in the reservoir, water-supply rights, easements, and interests thereto belonging, situate in the several parishes of Llangynog, Llanrhaid-yn-Mochant, Hirnant, and Penmynydd, in the county of Montgomery; and also the WHOLE of the movable PLANT and MACHINERY of the said company.

The Llangynog Lead Mines have been a highly productive and dividend-paying property.

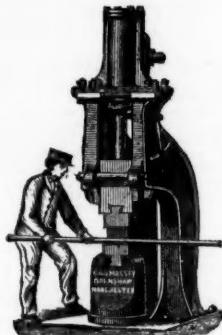
B. & S. MASSEY, OPENSHAW, MANCHESTER.

PRIZE MEDALS AWARDED:—Paris, 1867 Havre, 1868 Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873.

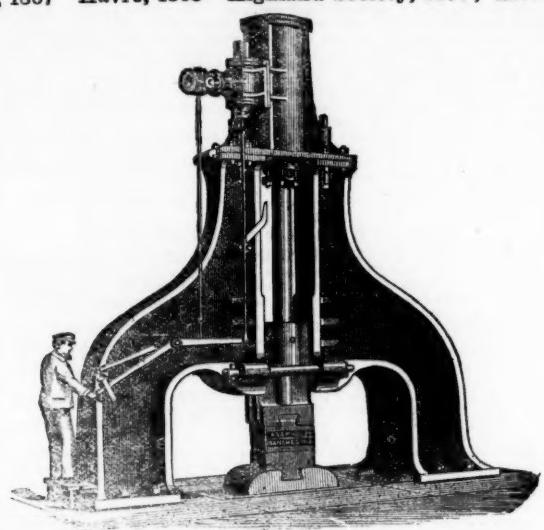
Patentees and Makers of Double and Single-acting STEAM HAMMERS of all sizes, from $\frac{1}{2}$ cwt. to 20 tons, with self-acting or hand motions, in either case giving a perfectly DEAD BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers, working up to 500 blows per minute, in some cases being worked by the Foot of the Smith, and not requiring any separate Driver.



Small Hammer with Foot Motion.



General Smithy Hammer.

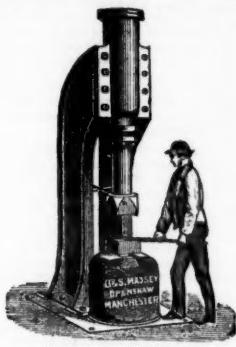


Steam Hammer for Heavy Forging.

SPECIAL STEAM STAMPS, of great importance for Forging, Stamping, Punching, Bolt-making, Bending, &c. STEAM HAMMERS for Engineers, Machinists, Ship-builders, Steel Tilters, Millwrights, Coppersmiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutlers, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c.; also for Use in Repairing Smithies of Mills and Works of all kinds; for straightening Bars, bending Cranks, breaking Pig-iron, &c.



Special Steam Stamp.



General Smithy Hammer.

From 60 to 100 Steam Hammers and Steam Stamps may usually be seen in construction at the Works.

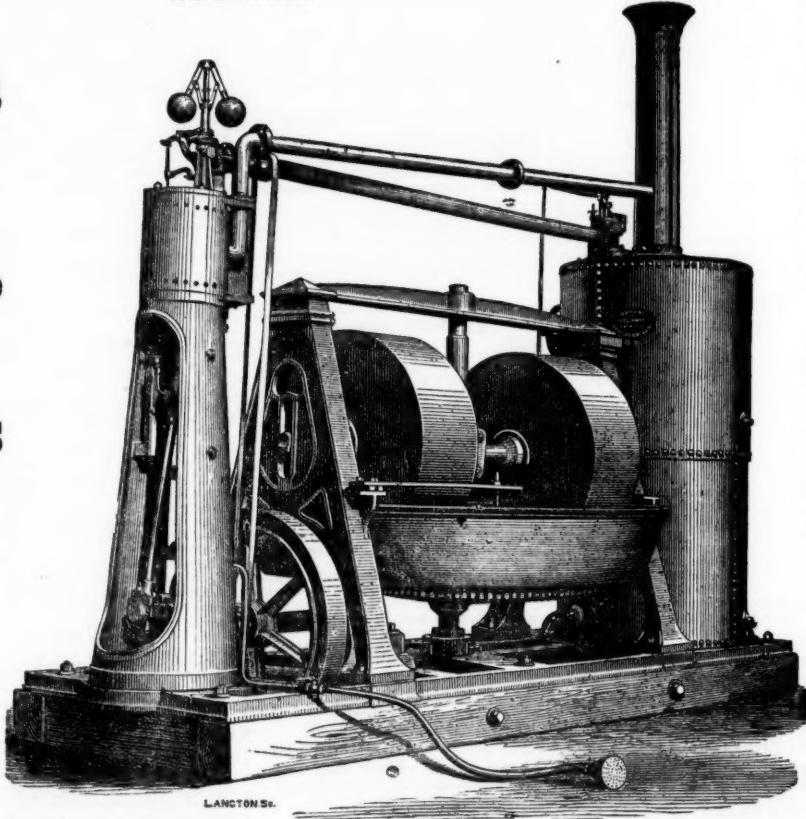
BARROWS & STEWART, ENGINEERS, BANBURY,

MANUFACTURE

PORATABLE
Steam Engines
With Gear for
Winding,
Pumping, and Ore
Crushing.

ALSO,

COMBINED MILLS
and ENGINES,
with or without
BOILERS,
for Grinding
Cinders, Sand,
Mortar, &c.



N. HOLMAN AND SONS,
BRASS AND IRON FOUNDRIES AND ENGINE WORKS,
PENZANCE AND ST. JUST, CORNWALL.
Sole Makers of Stephens's Improved Patent Pulveriser,
FOR REDUCING TIN ROUGHS, LEAD SKIMPINGS, AND OTHER ORES.

The advantages possessed by these machines over others are—
1.—THE CHEAPNESS.
2.—THE SIMPLICITY OF CONSTRUCTION.
3.—THE DURABILITY OF THE WEARING PARTS.
4.—THE QUANTITY OF STUFF PULVERISED.

5.—THE PERFECT MANNER IN WHICH IT IS DONE.
6.—THE SMALL AMOUNT OF POWER REQUIRED TO
DRIVE THEM.

MACHINES MADE SPECIALLY FOR EXPORTATION.

For prices, testimonials, and further particulars, apply to N. H. and Sons, Sole Makers, at the above address, or to our London Agent below.

N.B.—Any person or persons infringing on the patent or manufacture of these machines, or any part thereof, will be prosecuted under the Act.

Estimates given for all classes of Mining Machinery, &c., for home and foreign supply.

ORDERS PROMPTLY ATTENDED TO.

London Agent—Mr. J. COATES, 33, Frederick Street, Gray's Inn Road, London, W.C.

ST. LAWRENCE ROPEWORKS, NEWCASTLE-ON-TYNE. ESTABLISHED 1782.

THOMAS AND WILLIAM SMITH,

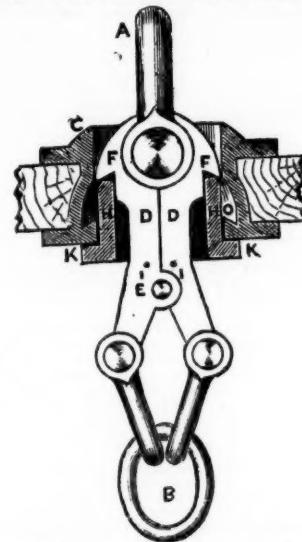
Manufacturers of all kinds of Iron, Steel, Copper, and Galvanised Wire Ropes, Hemp and Manilla Ropes, &c., Round and Flat Shaft Ropes, Crab Ropes, Guide Ropes, Hauling Ropes, and Galvanised Signal Strand, Ships' Standing Rigging fitted complete, Patent Hemp and Manilla Hawser, Warps, Cordage, Spun Yarn, &c., &c., Manilla Yarn for Telegraph Cables, &c., Flat Hemp Ropes for Driving Bands, Steel Plough Ropes, Fencing Wire and Strand, Lightning Conductors, &c.

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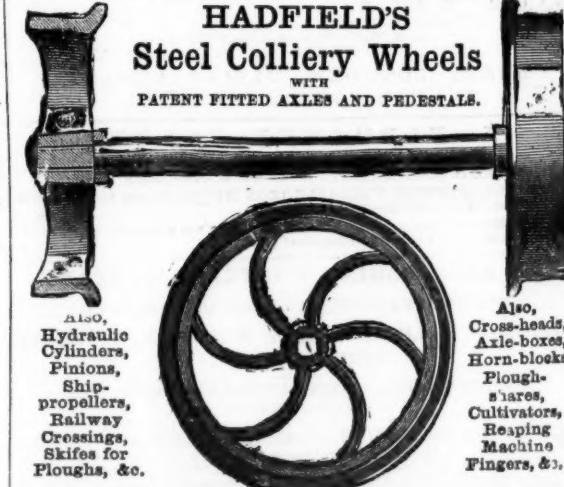
Walker's Hook, at Tockett's sinking, has saved six men's lives. On the 6th instant, the kibble was overwound, and but for the hook would have fallen down the pit, where six men were working, 120 ft. below, all of whom would probably have been killed. Thanks, however, to Mr. Walker's invention, the rope alone passed harmlessly over, the kibble remained suspended, and in half-an-hour everything was working as if nothing had occurred.—From the *Northern Echo*, August 20, 1874.

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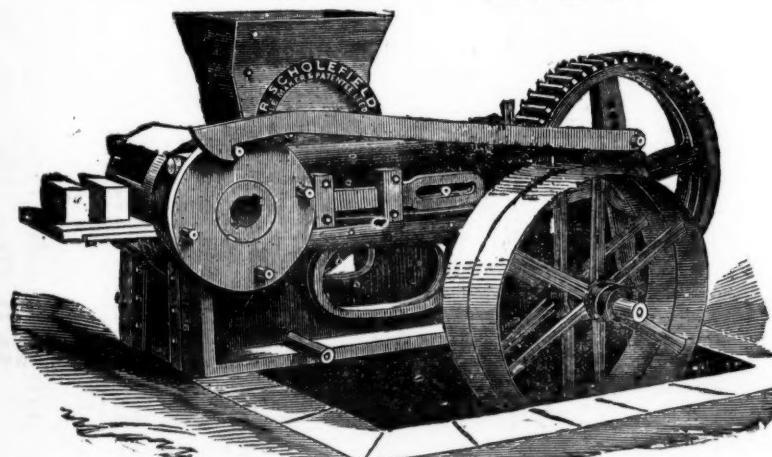
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uction, and the hands required to make 10,000 pressed bricks per day:—

2 men digging, each 4s. per day	£0 8 0
1 man grinding, 4s. 6d. per day	0 4 6
1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day	0 2 0
1 boy greasing, 1s. 6d. per day	0 1 6
1 engine-man, 5s. per day	0 5 0
1 man wheeling bricks from machine to kiln, 4s. per day	0 4 0
Total cost of making 10,000 pressed bricks	£1 5 0, or 2s. 6d. per 1000.

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

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BICKFORD, SMITH, AND CO., of TUCKINGMILL, CORNWALL; ADELBHI BANK CHAMBERS, SOUTH JOHN-STREET, LIVERPOOL; and 85, GRACECHURCH-STREET, LONDON, E.C., MANUFACTURERS AND ORIGINAL PATENTEEs of SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—

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- 2.—From 60 to 70 per cent. of the labour is saved.
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EXTRACTS FROM TESTIMONIALS RECEIVED:—

Mr. C. E. BAINBRIDGE, of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 27th September, 1873, says—"After a full season's experience of the very complete Dressing Machine erected by you at our Colberry Mine, we are fully satisfied with our decision to adopt your patents in preference to all others. The machinery does its work as well as we can desire, and better than we anticipated. We are now getting through 70 tons of ore/stuff per day, of rich quality. Without your machinery we should have been at a stand still, for we cannot get hands to supply our wants elsewhere. It saves fully one-half of the old wages, and vastly more on the wages we now give, and the saving in ore is not much short of 10 per cent. You can quote from this letter as you think proper."

Mr. COULTAS DODSWORTH, of Haydon Bridge, writes, on the 15th January, 1874:—"I have just returned from the Stonecroft and Greyside Mines, where I have seen your 'Patent Ore Dressing Machinery' at work, with which I must say, I was highly pleased. It is decidedly the best machinery I have ever seen for the purpose, the results being as near perfection as possible, and I am quite sure its use in this case will be a very great saving to the company. No large mining establishment should be without your machinery, especially when labour is difficult to procure—a mere fraction of the hands being only required as against the old system, and they work altogether much better done, and a great saving of ore effected. I have heard it said that your machinery is better adapted for poor than for rich ores, but from what I have seen to-day I am quite confident it will do for any kind of ores. I beg not only to congratulate, but also to compliment, you on the great success of your 'Patent Ore Dressing Machinery.' You may use this letter as you think proper."

Mr. MONTAGUE BEALE, Managing Director of the Cagliara Mining Company (Limited), says, on May 15th, 1873:—"I have much pleasure in speaking of the great efficiency of your 'Patent Dressing Machinery,' as erected by you at our mines at Rossas, in the Island of Sardinia. You will remember it has always been considered impossible to dress, or rather separate, the minerals our ores contain by machinery, but our captain assures me he has a constant return of 76 per cent. of lead with the greatest ease, and I know by the returns we are realising the best market price. I consider this company is much indebted to you for the success you have achieved at so small a cost. If may interest you to know, from my experience in several of the British possessions, including the whole of the Australian Colonies, that my opinion is I have never seen any dressing machinery that can efficiently, and at so small a cost, dress, and separate metallic ores, however close the mechanical mixture may be, as yours. You can use this letter in any way you think proper."

The most satisfactory testimonials also have been received from the GREENSIDE MINE COMPANY, Westmoreland; the TALAROGH MINING COMPANY, North Wales, and others. Copies of these may be had from Mr. GREEN.

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THE MINING SHARE LIST.

THE MINING JOURNAL.

AUGUST 21, 1875

BRITISH DIVIDEND MINES.										NON-DIVIDEND MINES.										NON-DIVIDEND MINES—Continued.									
Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Total divs.	Per share.	Last paid		Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Total divs.	Per share.	Last paid	Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.								
150 Alderley Edge, c, Cheshire*	10 0 0	—	—	—	12 6 8	0 8	Jan. 1875	25000 Aberdannant, t, Llandilo	1 0 0	—	1 1/4	1 1/4	—	2 0 0	—	—	12000 West Goginan,* Cardiganshire	2 0 0	—	—	—	—	—	—	—	—			
30000 Bampfylde, c, i, mn., Devon*	1 0 0	—	1 1/4	1 1/4	0 2 0	0 2 0	June 1875	10000 Aberystwith,* t, Cardigan	5 0 0	—	1 1/4	1 1/4	—	2 0 0	—	—	15000 West Great Work, t, Breage*	2 0 0	—	—	—	—	—	—	—	—			
6500 Blen Caelan, s, Cardigan (64 sh.)	3 10 0	—	—	—	0 10 0	—	—	50000 Ballycumisk, t, Schull	2 0 0	—	—	—	—	—	—	15000 West Llangynog, s, Montgomery	2 0 0	—	—	—	—	—	—	—	—				
200 Botallack, t, c, St. Just*	116 5 0	—	45	40 45	0 10 0	—	—	12000 Bedford Consols, c, Tavistock	1 8 0	—	—	—	—	—	—	12000 West Milw, s, Flint	2 0 0	—	—	—	—	—	—	—	—				
10000 Brookroyd,* t, Cardigan	1 7 6	—	—	—	619 15 0	5 0 0	Aug. 1875	12000 Bedfort United, c, Tavistock	1 17 6	—	—	—	—	—	—	12000 West Pant-y-Go, s, Flint*	1 0 0	—	—	—	—	—	—	—	—				
4000 Brockwood, c, Buckfastleigh	1 16 0	—	41	31 4	0 10 0	—	—	12000 Blue Hills, t, St. Agnes	2 0 6	—	—	—	—	—	—	12000 West Phoenix, s, Linkinhorne	1 0 0	—	—	—	—	—	—	—	—				
8348 Cargill, s, Newlyn*	5 10 0	—	14	7 1	3 10 0	0 6	Jan. 1872	12000 Bog, t, Shropshire	2 0 0	—	—	—	—	—	—	12000 West Polbreen, t, St. Agnes	1 0 0	—	—	—	—	—	—	—	—				
6400 Cashell, t, Cumberland*	2 10 0	—	—	—	4 18 0	0 4 0	July 1872	12000 Bowden Hill, * mn.	1 0 0	—	—	—	—	—	—	12000 West Roskar, t, St. Bl., Camborne	2 0 0	—	—	—	—	—	—	—	—				
1000 Caris, c, t, Illogan	1 16 0	—	—	—	4 18 0	0 12 6	Oct. 1872	12000 Brynambar, t, Cardigan	1 0 0	—	—	—	—	—	—	12000 West Tankerville, t, Camborne	3 5 0	—	—	—	—	—	—	—	—				
6000 Cath. & Jans, t, Penrhyn-dinethm	38 0 0	—	37	35 87	308 0	0 1 0	Feb. 1874	12000 Burrow & Button, * t, c, bl, St. Agnes	1 0 0	—	—	—	—	—	—	12000 West Wheal Lucy, t, Lelant	1 0 0	—	—	—	—	—	—	—	—				
2450 Colk's Kitchen, t, Illogan*	5 0 0	—	—	—	7 8	0 7 6	June 1874	12000 Burra Burra, * t, c, bl, Kenwyn	1 0 0	—	—	—	—	—	—	12000 West Wheal Pever, t, Redruth	3 14 0	—	—	—	—	—	—	—	—				
10240 Devon G. Cons., c, Tavistock*	20 19 0	—	4	4 5	11 17 0	0 7 6	June 1875	12000 Bwdairian, s, Cardigan (64 shares)	3 19 0	—	—	—	—	—	—	12000 West Wheal Seton, c, Camborne	63 15 0	—	—	—	—	—	—	—	—				
4296 Dolcoth, c, t, Camborne	1 0 0	—	—	—	11 17 0	0 7 6	Jan. 1875	12000 Bluebell, t, Camborne	1 0 0	—	—	—	—	—	—	12000 West Wheal Agar, c, Illogan	10 10 0	—	—	—	—	—	—	—	—				
6500 Drake Walls, t, c, Calstock	10 14 10	—	40	39 41	116 10 0	0 12 0	May 1872	12000 Bodstone, * mn.	1 0 0	—	—	—	—	—	—	12000 West Wheal Argus, t, Sancreed	1 0 0	—	—	—	—	—	—	—	—				
10000 East Balleswidden, t, Sancreed*	6 0 0	—	—	—	106 18 8	0 10 0	June 1872	12000 Cae Gynon, , Cardigan*	2 0 0	—	—	—	—	—	—	12000 West Wheal Arthur, t, Calstock	1 0 0	—	—	—	—	—	—	—	—				
6144 East Caradon, c, St. Cleer*	1 0 0	—	—	—	0 2 0	0 1 0	July 1874	12000 Castle Gate, t, St. Columb	1 0 0	—	—	—	—	—	—	12000 West Wheal Basset and Grylls, t	1 0 0	—	—	—	—	—	—	—	—				
200 East Darren, t, Cardiganshire	2 14 6	—	—	—	2 11 0	0 5 0	Feb. 1874	12000 Cathedral, t, c, Gwenwyn*	1 0 0	—	—	—	—	—	—	12000 West Wheal Coates, t, St. Agnes	9 18 0	—	—	—	—	—	—	—	—				
6400 East Pool, t, Illogan	32 0 0	—	1	1 1/4	14 19 0	0 0 0	July 1875	12000 Cefn Brywno (lim. to £5)	5 0 0	—	—	—	—	—	—	12000 West Wheal Crebwr, c, Tavistock	2 0 0	—	—	—	—	—	—	—	—				
1908 East Wheal Lovell, t, Wendron*	0 9 9	—	12 1/4	13 1/4	22 10 10	0 1 0	July 1875	12000 Central Foalde, t, Isle of Man (64 sh.)	1 0 0	—	—	—	—	—	—	12000 West Wheal Grange, t, Cardigan*	4 1 0	—	—	—	—	—	—	—	—				
2800 Foxdale, t, Isle of Man*	5 19 0	—	—	—	7 8	0 7 6	Oct. 1874	12000 Court Gran, t, Cardigan*	1 0 0	—	—	—	—	—	—	12000 West Wheal Jewell, c, Marazion	10 2 0	—	—	—	—	—	—	—	—				
4000 Glamorgan, t, Isle of Man*	25 0 0	—	—	—	20 7 6	0 7 6	Oct. 1874	12000 Deer Park, t, c, Tavistock	2 0 0	—	—	—	—	—	—	12000 West Wheal King, t, Illogan	1 0 0	—	—	—	—	—	—	—	—				
18000 Great Laxey, t, Isle of Man*	10 10 0	15s p.	—	—	80 15 0	0 10 0	Sept. 1874	12000 Denbighshire Consolidated, * t	3 0 0	—	3	2 1/4	3	—	—	12000 West Wheal Peever, t, Redruth	5 15 0	—	—	—	—	—	—	—	—				
28000 Great West Van, t, Cardigan*	4 0 0	—	15	14 15	0 7 4	0 7 4	Jan. 1875	12000 Dolwen Hill Cons., t, c, Plympton	4 18 0	—	—	—	—	—	—	12000 West Wheal Speedwell, t, c, Bregg	1 0 0	—	—	—	—	—	—	—	—				
6908 Great Wheal Vor, t, Helston*	2 0 0	—	—	—	18 3 0	0 8 0	July 1875	12000 Dubby Syke, t, Durham*	0 5 0	—	—	—	—	—	—	12000 West Wheal Vincent, t, Alternan	12 13 0	—	—	—	—	—	—	—	—				
8400 Green Hurth, t, Durban*	40 15 0	—	36	34 36	15 18 0	0 2 0	Aug. 1874	12000 Elgar, s, Cardigan*	60 0	—	—	—	—	—	—	12000 West Wheal Willoughby, t, Llanrwat	2 10 0	—	—	—	—	—	—	—	—				
20000 Grogwinion, t, Cardigan*	0 6 0	—	—	—	12 1/2	0 0 0	Oct. 1874	12000 Ellyliffe, t, Montgomeryshire	60 0	—	—	—	—	—	—	12000 West Wheal Wyndham, t, Llanrwat	5 0 0	—	—	—	—	—	—	—	—				
9850 Gunnislake (Clitters), t, c	5 5 0	—	12	11 1/2	89 2	0 15 0	Oct. 1875	12000 East Black, Craig, t, Scotland	75 15 0	4	3 4	3 4	3 4	3 4	3 4	12000 West Wheal Arthur, t, Calstock	2 7 5 0	0 0 0	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4				
1024 Herodsfoot, t, near Liskeard*	12 0 0	—	34	33 34	89 2	0 15 0	Oct. 1875	12000 East Boscastle, t, St. Just	25 0	—	—	—	—	—	—	12000 West Wheal Basset and Grylls, t	15 0	—	—	—	—	—	—	—	—				
18000 Hington Down, c, Calstock*	8 10 0	—	34	33 34	89 2	0 15 0	Oct. 1875	12000 East Bottrel Hill Cons., t, c, Plympton	5 0	—	—	—	—	—	—	12000 West Wheal Coates, t, St. Agnes	10 0	—	—	—	—	—	—	—	—				
25000 Killasee, s, Tipperary	1 0 0	—	—	—	8 1/2	0 1 0	Dec. 1875	12000 East Chiverton, t, Perranzabuloe	3 0 0	—	—	—																	

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

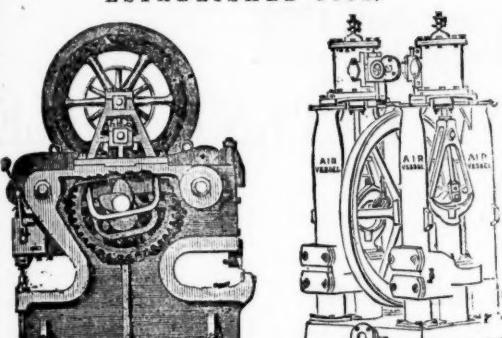
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of Engines
Represented by
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HARVEY AND CO.,
ENGINEERS AND GENERAL MERCHANTS,
HAYLE, CORNWALL,
HAYLE FOUNDRY WHARF, NINE ELMS, LONDON,
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MANUFACTURERS OF
PUMPING and other LAND ENGINES and MARINE STEAM ENGINES
the largest kind in use, SUGAR MACHINERY, MILLWORK, MINING
MACHINERY, and MACHINERY IN GENERAL.
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SECONDHAND MINING MACHINERY FOR SALE.
In FIRST-RATE CONDITION, AT MODERATE PRICES.
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STEAM CAPSTANS; and CRUSHERS of various sizes. BOILERS, PIT
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THE PATENT PNEUMATIC STAMPS
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MANCHESTER SCREW-BOLT WORKS.
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200 TONS OF BOLTS, NUTS, &c., ALWAYS IN STOCK,
MADE BY PATENT MACHINERY.



Will make 10 bolts per minute. Will make 60 nuts per minute.
Patentees and Makers of Special Machinery for Bolt,
Spike, and Nut Manufacturing.

Over 60 of these Bolt and Spike-making Machines have been sold to Engineers,
Railway Carriage and Wagon Builders, and Screw Bolt Manufacturers.
These Nut-making Machines will produce 65 to 85 nuts per minute, $\frac{1}{2}$ to $\frac{3}{4}$ in.
diameter of hole, at a cost for labour of $\frac{1}{2}$ d. to 1d. per gross.
Machines to make up to $1\frac{1}{4}$ in. nuts are in progress of making.
To see the Machines working, apply as above.



THE MCKEAN ROCK DRILL

IS NOW BEING FURNISHED EXCLUSIVELY FOR THE
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SIXTY MCKEAN DRILLS—MCKEAN RAILWAY TUNNEL AUTOMATIC
DRILL—ordered on 29th April, 1875, are now in course of con-
struction for this work.

THE MCKEAN ROCK DRILL is attaining general use throughout the World for Mining, Tunnelling, Quarrying, and Sub-Marine Boring. EIGHT DIFFERENT TYPES AND SIZES OF THE MCKEAN DRILL are now produced, affording a selection of the most suitable for any special work. The smallest Mckean Rock Drill weighs only 70 lbs. ALL MCKEAN'S ROCK DRILLS ARE GUARANTEED FOR A TERM, WITHOUT EXTRA CHARGE.

The MCKEAN ROCK DRILLS are superior for many reasons:—
They are the most powerful.
They are the most portable.
They are the most durable.
They are the most compact.
They are of the best mechanical device.
They contain the fewest parts.
They have no weak parts.
They act without shock upon any of the operating parts.
They work with a lower pressure than any other Rock Drill.
They may be worked at a higher pressure than any other.
They may be run with safety to 1500 strokes per minute.
They do not require a mechanic to work them.
The same machine may be used for sinking, drifting, or open work.
They are the smallest, shortest, and lightest of all machines.
They will give the longest feed without change of tool.
They work with long or short stroke at pleasure of operator.
The working parts are best protected against grit, and accidents.
The various methods of mounting are the most efficient.

FOR MOUNTAINOUS DISTRICTS

Without roads and inaccessible to heavy machinery, the Mckean Drills and light special plant are thoroughly adapted.

Owners of Mines in such undeveloped regions have by their use the means of quickly testing and developing their Mineral Properties at small expense.

MERCHANTS AND AGENTS

Purchasing the Mckean Rock Drills for export can have the fullest assurance of satisfying their correspondents abroad, and of opening new and profitable trade.

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THE ADVANTAGE TO BE GAINED BY THE APPLICATION
OF THESE MACHINES IN THE EXECUTION OF
CONTRACTS, BASED UPON HAND-LABOUR PRICES.

N.B.—Correspondents should state particulars as to character of work in hand in writing us for information, on receipt of which a special definite answer, with reference to our full illustrated catalogue, will be sent.

250 MACHINES IN USE AND SOLD.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,
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The Mckean Drill may be seen in operation daily in London.

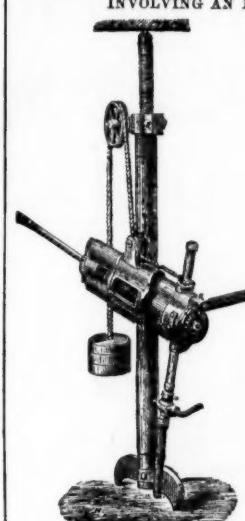
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THE "WARSOP" ROCK DRILL, INVOLVING AN ENTIRELY NEW PRINCIPLE.

WORKS AT 16 LBS. PRESSURE.
CHISEL NOT ATTACHED TO PISTON,
THEREFORE NO
FRICTION AGAINST SIDES OF HOLE.
NO JAMMING OR BREAKING DRILLS.
NO FIXING NOR STAYING.
NO STRIKING ACTION IN VALVES.
MAY BE USED WITHOUT ANY
STAND.



N.B.—The under-noted prices are for
THE DRILL COMPLETE,
And instead of INDEFINITE GENERALITIES,
ACCURATE DATA are given below, with the
object of enabling purchasers to compare
the "WARSOP" in all points with other
Drills.

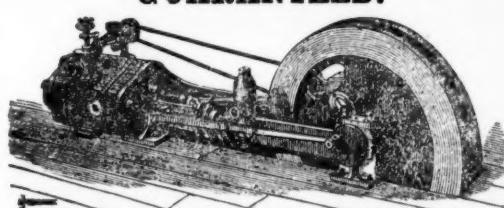
Weights	Bores	On triped. On heading stand.
No. 1..... 65 lbs.....	1½ holes.....	£60 £76
No. 2..... 80 ,,,	2 ,,,	66 80
No. 3..... 105 ,,,	3½ ,,,	88 104

HEADING STAND weighs 1 cwt.

NO. 2 DRILL on HEADING STAND (2" holes) ... £76
No. 1 AIR COMPRESSOR and ENGINE 85
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Total..... £184

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ECONOMICAL STEAM POWER GUARANTEED.



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PATENT "EXPRESS" ENGINES.
PATENT EXPANSIVE ENGINES.
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NEAR REDRUTH, CORNWALL,
Are now selling Fire Goods of superior quality, manufactured
from clay which has been subjected to the strongest tests, and
proved to resist a greater amount of heat than any yet offered
in the market.

Samples and prices on application at the Works; or of
Beer, Musgrave, & Co., Merchants
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THE "KAINOTOMON" ROCK DRILL,

The SIMPLEST, CHEAPEST, and BEST Machine in the World for SINKING, MINING, and QUARRYING,

It has been selected by the Admiralty for their works, and is extensively used at the principal Mines, Collieries, and Quarries of Great Britain, and the Continent of Europe.

"To this invention, which appears to possess several advantages over the machines previously exhibited at Falmouth, the Judges are unanimous in awarding a first-class silver medal" (the highest award).—Report of the Judges at the Royal Cornwall Polytechnic Society's Exhibition, 1873.

"The boring machine works splendidly."—W. TORRANCE: Mid-Calder.

"For simplicity, compactness, and performance of work, your drill excels all others."—JOHN MAIN: Crossfield Ironworks.

"Under the most difficult circumstances, they give every satisfaction."—G. GREY: Montreal Iron Mines, Cumberland.

"The simplest and best boring machine."—Capt. WASLEY's letter to the Mining Journal, Oct. 18, 1873.

"It gives every satisfaction."—W. E. WALKER: Lord Leconfield's Iron Mines.

"The rock-drill I bought of you seven months ago has given me entire satisfaction, and I am convinced that the 'Kainotomon' is the best rock-drill in the market."—P. MCGINNIS: Strabane.

"I am quite satisfied with the working of it. For sinking pits it is a first-rate invention; I can do as much boring with it myself as six men can do by hand."—S. JENKINS: Artillery.



The advantages over other Rock-boring Machines claimed for the "Kainotomon" are—

- 1.—It is much shorter.
- 2.—It is much lighter, and more readily removed from place to place.
- 3.—It requires the turning of ONLY ONE, instead of a number, of set screws, to fix it in position at any angle.
- 4.—It may be fed 3 inches out of stroke, without stopping the working of the drill, an invaluable advantage.
- 5.—It is not liable to derangement.
- 6.—It has not one-third the number of parts in its construction.
- 7.—All stuffing-boxes and parts requiring adjustment are dispensed with.
- 8.—It is so simple in its construction that any ordinary labourer or miner can drive it, simply having to turn on the motive power and feed the drill.
- 9.—The rotation is compulsory, and regular.
- 10.—40 lbs. pressure only is required to work it.
- 11.—A saving of over 50 per cent. in iron and flexible piping.

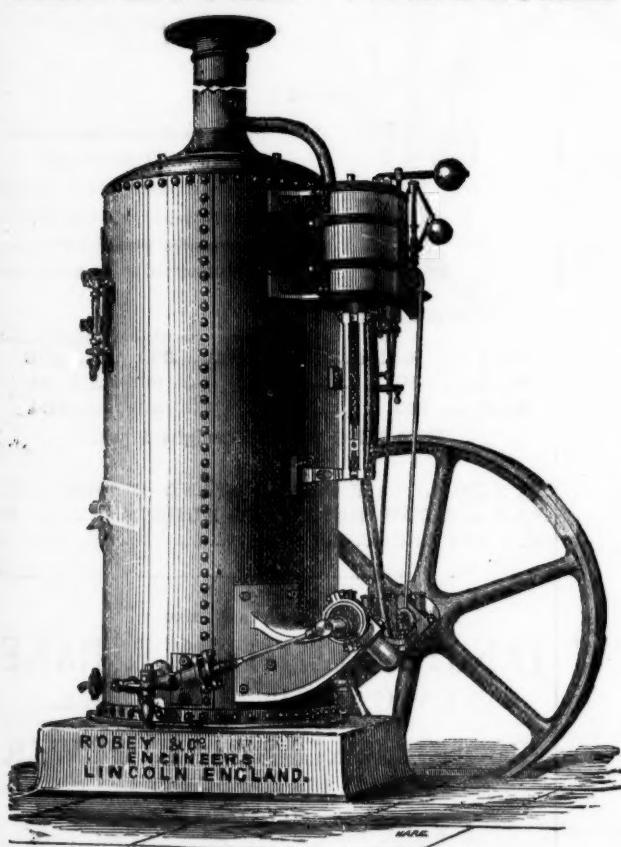
THE "ECONOMIC" COAL-CUTTERS, AIR COMPRESSORS, BOILERS, &c.

THOS. A. WARRINGTON, 30, KING STREET, CHEAPSIDE, LONDON, E.C.

Patent No. 4136
Patent No. 4150

Dated 16th December, 1873.
Dated 17th December, 1873.

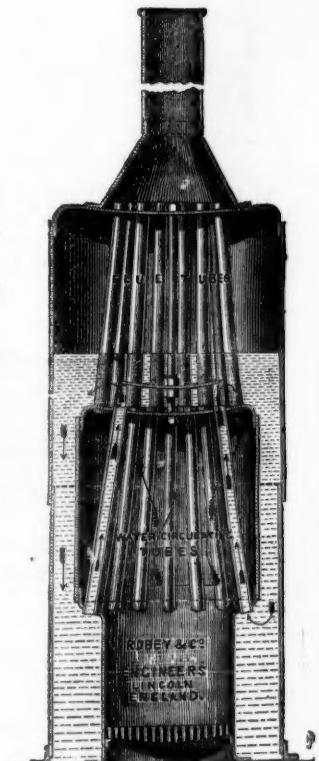
IMPROVED VERTICAL STEAM ENGINES AND PATENT BOILER COMBINED.



The Illustrations show one of Robey and Co.'s improved vertical Engines.

All these engines are supplied with Robey and Co.'s new patent vertical boiler, as per section illustrated, which has among others the following advantages over all vertical boilers yet produced:

- PERFECT CIRCULATION OF THE WATER.
- SEPARATION OF THE SEDIMENT.
- GREAT DURABILITY.
- GREAT ECONOMY IN FUEL.



PRICES AND FULL PARTICULARS ON APPLICATION TO THE SOLE MANUFACTURERS:—

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CAUTION.—Notice is hereby given, that any person infringing the above Patents will be forthwith proceeded against.

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FOR
MARINE & LAND ENGINES

ARE THE
CHEAPEST, SIMPLEST, MOST EASILY APPLIED,
MOST SENSITIVE, MOST POWERFUL, OCCUPY LEAST SPACE,
ARE MOST EFFECTIVE IN ALL EMERGENCIES
At sea or on shore, and are the

ONLY ONES WHICH GIVE THE FULL PRESSURE
In the boiler to the piston at the top and bottom of the stroke automatically cutting off the steam according to the requirements of the work, thereby effecting an

IMPORTANT SAVING OF FUEL,

And, in case of a break-down,

INSTANTLY SHUT THE STEAM COMPLETELY OFF

Thus preventing further damage.

For Prices, Licenses to Manufacture, and other particulars, apply to—

ANDREW LEIGHTON & CO.,
6, SOUTH CASTLE STREET, LIVERPOOL.

Coal-Getting by Patent Hand-Worked Machinery, WITHOUT THE USE OF GUNPOWDER.

- No. 1 MACHINE - THE HAND COAL-CUTTER, for under-cutting.
2 ,, - THE ROCK & COAL PERFORATOR, for drilling.
3 ,, - THE SCREW WEDGE, for breaking down.

The use of these Machines, while doing away with the greatest source of danger, economises at least Fifty per cent. of the labour required in Getting Coal.

Particulars on application to—

MARTIN MACDERMOTT,
SCOTT'S CHAMBERS, PUDDING LANE, LONDON, E.C.

VARLEY & YEADON, COLLIERY & BRICK-MAKING ENGINEERS,

Manufacturers of WINDING, HAULING, and PUMPING ENGINES, Boilers and Fittings, Steam Piping, Donkey Pumps, Lift Pumps, Perforated Clay and Mortar Mills, Brick Presses, Pug Mills, Round and Flat Rope, Pit-head Pulleys, Wrought-iron Head Gear, ROOFS and GIRDERs, Kibbles, ONE, TWO, and THREE-DECK CAGES, COAL TIPPING and SCREENING APPARATUS, VENTILATING FANS, TUBBING, GIRDERs, PILLARS, POINT PLATES. Steam or other Cranes, Crabs and Windlasses, Machines for Cutting Stone, &c.

CROWN POINT FOUNDRY, LEEDS.

Estimates furnished on application.

Original Correspondence.

ON THE ANTHRACITIC COAL OF DEMONTE, NEAR CUNEO,
IN THE ITALIAN ALPS—No. III.By the Chevalier W. P. JERVIS, Conservator of the Royal Italian Industrial
Museum in Turin, &c., &c.[Translated from the *Industriale*, of Milan, with additional information.]

In the experiments executed at Sampierdarena, with a standard tubular boiler, the evaporative power of these blocks was found to range between 3.66 lbs. and 5.9 lbs. per pound of fuel employed. For forging iron two experiments were made with bar of 6 in. thick; the first time the operation lasted 3½ hours; the second time only 2½ hours; half an anvil, of the weight of 200 lbs., was also forged. The blocks were also placed in a cupola furnace for melting cast-iron, 80 per cent. being mixed with English coke, and in less than two hours four recipients of molten metal were taken out of the furnace, of which the first two, not being of very good quality, were employed for the use of the factory, while the other two gave excellent cast-iron, perfectly fluid.

Another experiment was made in a large iron furnace, the castings required being of an important kind. The proportions employed were as follows:—Demonte coal, one-third; coke, two-thirds; and in the customary time 4½ tons of cast-iron were obtained. If not of the very best kind to be had, with English coal by no means inferior to what is obtained by the use of coke alone. In fine, the blocks were found to be very suitable for a Cornish tubular boiler, belonging to a 15-horse power engine; 75 per cent. of Demonte coal was mixed with 25 per cent. of Cardiff coal, and with this proportion the pressure was uniformly kept up to 4½ or 4¾ atmospheres.

Such are the results obtained by Messrs. Ansaldi and Co., and extracted from the report on the subject they handed to the proprietors of the mine. Surely they are sufficient to prove the applicability of the artificial fuel to numerous purposes, and I shall, therefore, abstain from further details on the subject.

§ 12.—Relative quantity of Coal and Lignite produced in various European countries, as compared with Italy, and practical deductions.

AUSTRIA.—In the year 1865 Austria produced:—

Coal	Tons 2,532,933
Lignite	1,999,482

Since that date, however, the quantity has very considerably increased through the extension of railways in the coal and lignite-producing districts, and the greater scarcity of wood as a fuel.

BELGIUM, a little kingdom, with only 4,829,320 inhabitants (census of 1866), holds one of the first positions in Europe as a manufacturing country, owing to the extraordinary abundance of coal in its southern province. In the year 1866 there were 174 coal mines at work, the production of which was as follows:—

Coal	Metric tons of 1000 kilogrammes* 12,774,662
------------	---------------------------------------------

The price of lump coal was from 15s. 1d. to 15s. 8d. per metrical ton that of small coal from 7s. 8d. to 8s. 11d.

FRANCE, including Alsace and Lorraine, furnished in the year 1866, before the war, 13,100,000 tons of coal, but the production has risen very rapidly within the last few years, so that, exclusive of the above-named provinces, now part of the German Empire, the quantity raised in 1873 was—

Coal (including, however, a small quantity from the Trias formation)	Metric tons 17,031,854
Lignite	453,931

323 coal mines were at work in the year 1869, but I have no exact date for 1873. At the last-mentioned date the consumption of mineral fuel was 25,000,000 metric tons, the deficiency being imported from England, Germany, and Belgium.

GERMANY.—The mines of the kingdom of Prussia alone gave in the year 1866—

Coal	Metric tons 16,547,745
Lignite	4,649,527

But all this together represents but a small fraction of the coal raised from the British coal mines.

GERMAN BRITAIN.—As is generally known, the coal is obtained almost exclusively from mines in England, Wales, and Scotland, the Irish production being exceedingly insignificant. I am indebted to the admirable analysis of Mr. Hunt, of which he kindly sent me a copy, for the following statements:—

Coal production.	1867. Tons. 1871. Tons.
Consumed in the United Kingdom ...	93,934,651 = As coal, and reduced to coke. 104,832,154
Exported to Italy.....	In natural state.. 791,897
Exported to other countries	Coked 16,498
	In natural state.. 11,416,112
Total production	Coked 326,367

Total production	104,500,480 117,352,028
------------------------	-------------------------------

The number of coal mines at work in 1871 was 2760. No less than 7,211,853 tons of coal were introduced in the course of the year 1871 within the limits of the London district for the consumption of the metropolis. It may be stated that the value of the British coal imported into Italy may be taken at 1,000,000£. at the port of discharge, including freight, &c.

Everyone knows that Great Britain stands foremost as a mineral-producing country; the mines are also worked on the most approved principles, and with the powerful leverage of large capital, which renders it possible to execute the boldest works necessary to carry out the operations to the entire satisfaction of those to whom the mines are entrusted, but it may be less generally supposed that a great proportion of the value of the produce consists of coal.

In 1871 the value of the produce of the British mines was—

Coal	£35,205,608
Other minerals of every description	12,288,792 = £47,494,400

So that coal represents 74 per cent. of the total value!

ITALY.—Alongside of these figures, all built up of millions, what was the produce and consumption of mineral fuel in Italy in 1868? Produce of the mines:—

Lignite and other mineral fuel (excepting peat)	Metric tons 59,000
-------------------------------------------------------	--------------------

Pet	70,000
-----------	--------

Imported:—	
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Coal and lignite, the former almost exclusively from Great Britain	556,000
--------------------------------------------------------------------	---------

Total	Metric tons 678,000
-------------	---------------------

I will now proceed to examine the consumption of mineral fuel in Great Britain, as compared with Italy, per head of the population in either country, observing, however, that since the date specified the crowning work of modern aspiration has been accomplished by Rome becoming the capital of the kingdom of Italy, with the incorporation of the last remnant of the Papal States, since which civilisation and industrial activity into that lately so benighted region, and consequently the importation of coal has greatly increased.

Taking the population of the United Kingdom at 29,321,288 (census of 1861), and assuming the coal consumed in the kingdom to have been 104,802,154 tons in 1871, as above, we have a consumption of coal per head of 3255 lbs., or about 29 cwt. = 1476 kilogrammes. Italy, with a population of 25,023,810 inhabitants (census of 1861), consumed 70,000 metric tons of peat raised in the country, or per head of population 27.1 kilogrammes = 5.98 lbs.; 52,000 metric tons of lignite, &c., raised in the country, or per head of population 208 kilogrammes = 4.44 lbs.: making a total per head of 4.79 kilogrammes = 10.42 lbs.

Comparing these data it results that the mineral fuel of Italy bears a proportion of somewhat less than 3.2:1000 to that burned per inhabitant in the United Kingdom; add to which that peat in the actual state, as given above, only produces about half the calorific effect of coal, so that the real proportion is less than I have mentioned. If the coal and lignite imported into Italy be added to the above quantity, giving as has been seen a total of 678,000 tons, the quantity burned per head of the population becomes 27.1 kilograms = 5.98 lbs. Compared with the consumption per head of the population of the United Kingdom, the proportion is 8.4:1000.

Coal has increased considerably in price everywhere of late years, and must certainly continue to have that normal tendency in future, quite independently of those fearful social earthquakes termed "strikes," whether they be derived from faults to be laid at the door

* The metric ton of 1000 kilogrammes is equal to 2205 English avoirdupois (or 35 lbs. less than the English ton). The difference is so insuperable for the present purpose that the reduction into English tons has not been deemed necessary.

of miners or capitalists; the result of the rise in price having always an identical effect, that of putting manufacturing interests in jeopardy. In one year coal rose in price 1.50 fr., or 15d. per ton. In Germany coal and lignite rise in price from the ever-increasing demand. In Austria, once so rich in noble forests, lignite of excellent quality is rapidly replacing vegetable fuel, so that its value will necessarily rise in the same ratio.

France obtained a considerable portion of her supply from Alsace and Lorraine, and since losing those provinces has applied her whole energies to extend the mines of the rich coal field discovered of late years in the department of the Straits of Calais, where enormous capital is being expended to attain the coal beds, generally lying under a cover of upwards of 80 fms. of cretaceous rocks, in spite of all which the results have proved highly creditable to the scientific and practical knowledge of the mining engineers, and no less profitable to the capitalists. Why should not the anthracitic coal of Italy be given a fair trial with appliances of equal skill and proper capital?

IRON MANUFACTURE.—Among the principal applications of coal may be mentioned its use as a steam generator for boilers of locomotives, portable and stationary engines, and evaporators of all kinds in manufactures; for iron metallurgy, and for household purposes. Never could the metallurgy of iron prosper in any country without having at command an abundance of fossil fuel at suitable prices. In a recent journey in Styria I was surprised to find that wood and charcoal were almost a matter of history in the province where once that fuel was alone employed, but which has given place to tertiary lignite of excellent quality.*

Another comparison similar to the foregoing, confining myself to Great Britain and Italy.

GREAT BRITAIN.—The production of iron may be thus summarily represented:—

1867.	1872.	
Pig-iron	Tons 4,761,823	6,741,929
Iron and steel	1,886,234	

Total 6,648,057

Six firms employed anthracite coal from the lower beds of the coal formation in 19 furnaces, from which were obtained 34,761 tons of pig-iron.

ITALY.—In the year 1867 the figures denoting the production stand thus:—

Pig-iron, 304,918; iron, 202,577; and steel, 40,416 metrical tons.

Comparing the quantity made in Italy in 1867 with that of Great Britain, the absolute proportion is:—

Pig-iron, 6.5:100; iron and steel, 12.8:100. Taken together, 8.24:100.

In many of the breaks and faults large dykes of syenite and hornblende porphyry are observable. These are especially large in the southern and south-western part of the district. The presence of these dykes of igneous rocks occupying the breaks of the strata suggests the origin of the disturbances that have upheaved, folded, and broken the sedimentary beds.

The Neptune and Kempton Mines appear in the Neptunian group, and the formation belongs entirely to the sedimentary system. South-west of these appear the Plutonic system, to which belongs the syenite and granites. The whole range is formed by the primitive—as primitive as the Silurian, and as Silurian by the paleozoic formation. This primitive joins east on the azole, south on the Tertiary, west on the alluvium, and runs north into the Great Salt Lake. The Plutonic rocks, as the syenite, granite, and porphyry, have broken through the strata of silica and lime (quartzite and dolomite), and have upheaved and overturned them.

Ore deposits appear in the West Mountain mining district—

1. As beds between the strata forming what are generally known as strata veins.

2. As contact veins in the syenitic porphyry between the shale and limestone, quartzite and limestone, quartzite and shale, syenite and quartzite, syenite and shale, syenite and limestone, and syenite and granite.

3. As true fissure veins in the syenitic granite.

4. As fissures alone breaking entirely through the strata. To the first-class belong the Neptune, Jordan, American Flag, Utah, Spanish Hills, Nero Perce Chief, No-You Don't Go, Semite, and many others, which all lie in one and the same belt. To the second class belong the Neptune, Grizzly, Nellie, Nero, and Winnemucca. To the fourth belongs the Kempton.

It is not necessary to explain the nature and the merits of these different classes of deposits, as it would require volumes. The quantity and richness of ore in any of these represents the true merit they have in the eyes of both miners and capitalists, and which is for them the measure of their value. The Neptune is both a bed and contact vein. It is a bed vein because it is conformable in strike and dip to the bedding or strata of the formation. Hence it, therefore, follows that the vein must conform to all foldings, slips, or disturbances of any incidental to the great upheaval. One must, therefore, look to the strata as the true indicator and guide of the vein at any point along its course. At the same time the Neptune is a contact vein, because it appears between the shaly quartzite as a hanging wall and dolomite, or magnesian limestone as a footwall. The shaly quartzite is about 30 to 40 ft. in thickness, and I do not believe that it forms the true hanging wall of the vein, as the ore in many places extends for 20 and 30 ft. into it; these are in many places as the developments west of the main incline in the great lead gallery, and east of the main inclines in the so-called galena chamber between the main and third levels, clearly show 5 to 15 ft. of ore behind this shaly quartzite. The Kempton (that is to say not the Kempton as located, but the lode developed and discovered in the Kempton Mine) is a fissure or gash vein, having all the appearance of a fissure, but not extending to a great depth. The Kempton crosses the Neptune, so that cutting through the hanging wall of the former we reach the latter. The Neptune is twice dislocated by a porphyry dyke, causing a slip. The slip does not extend far.

Another slip occurs between the Neptune and Kempton, close to the western end of the Kempton incline. This is a mere dislocation, and the separate parts are already united by the workings. The principal slide, however, is found west of the main incline by the Ashland shaft, where this vein enters the syenite. There can be no doubt that the vein will be found below when sought. I made above a sketch to distinguish the located Kempton and the real lode. The difference is this—the original discoverer and locator of the Kempton commences work, in fact, on the Neptune, and by working and developing it they discovered afterwards in the old Kempton incline the Kempton lode. The general bearing of the Neptune is south-west and north-east by east, with a dip of 38° 40' north-easterly.

The Neptune lode is from 4 to 40 ft. wide. At numerous places are bonanzas, or ore chambers, from 15 to 50 ft. wide, and from 10 to 110 ft. long. In these bonanzas are will mill as high as 65 oz. in silver, and up to 60 per cent. lead. From the first and second levels, all the way down to below the third level, from about 100 ft. west of the main incline to about 20 ft. west of the Kempton incline, which is a distance of over 200 ft., the vein carries from 5 to 28 ft. of first-class ore, from 10 to 30 ft. of concentrating ore, and 1 to 4 ft. of black sulphurite of copper ore. The Kempton lode has a general bearing of north 15° east, and dips 80° west. The vein is from 3 to 10 ft. wide. In the main level the Kempton carries 6 to 12 ft. solid galena, which assays 20 oz. in silver, 50 to 64 per cent. lead, and 25 in gold.

The Neptune vein contains galena, oxides, carbonates, sulphurites of lead, grey copper, and sulphurites of copper. The impurities in the ore are pyrites, decomposed pyrites, and oxide of iron. The Kempton vein contains galena, oxide, carbonate, and sulphurites of lead, and thin layers of red copper. The impurities in this ore are the same as in the Neptune. The average percentage of the first class is from 21 to 26 oz. silver, and 50 to 64 per cent. in lead. The second is 16 to 21 oz. in silver, 36 to 35 to 60 per cent. lead. Roasting and concentrating ore, 12 to 20 oz. in silver, and 35 to 60 per cent. lead. Copper ores, 16 to 26 oz. in silver, and 12 to 31 per cent. copper.

The chief work done on these mines is simply for development so far. The vein on the Neptune has been explored by sinking six inclined shafts at short distances from each other, following the dip of the vein, to a depth of 100 to 260 and 370 ft., which is in the vertical line 64 to 290 ft. from the uppermost starting point. Of these six inclines three have been closed, and filled up with waste, and from all have been run numerous drifts, tunnels, levels, and other inclines, altogether amounting to 4000 linear feet. Of these 4000 ft., 3500 ft. have been run under the present owners, Messrs. Schoenberg, since May 1, 1874. The Neptune main incline has been sunk 220 ft. The Kempton incline has been sunk 260 ft. The upper shaft has been sunk 200 ft. The discovery shaft has been sunk 100 ft. The upper level runs from the discovery shaft 130 ft. west, of which 65 ft. is entirely in ore. East of the upper level runs the whole distance through carbonate to the main Kempton incline.

The vein is here from 3 to 24 ft. wide. Above this level there are 700 tons of first-class carbonates. The main level runs over 250 ft. west, and from this the greatest part is on the vein, which is here from 6 to 45 ft. wide. Further, this main incline is a second level for 80 ft. east all the way through the vein, which is here from 20 to 45 ft. wide. West of the main Neptune incline, above this level, is a body of ore in sight. In the early part of the 17th century, he remarks, the rapid destruction of the forests occasioned great scarcity in the supply of charcoal to the furnaces, so much so that three-fourths of the blast-furnaces in the kingdom came to a standstill; it was at this period that attention was directed to the use of coal previously coked. After the attempts of several persons for some years in this direction Dud Dudley, ancestor of Lord Dudley, one of the principal iron manufacturers in England at the present moment, succeeded in making 3 tons of pig-iron from a furnace, in a week, with coke. Coke was successfully employed at the Colebrookdale Works in 1755.

In 1740 there were 59 little furnaces scattered over the country, whence 17,350 tons of pig-iron were obtained, partly with charcoal, partly with coke. In the year 1789 the quantity of pig-iron made in England and Wales was—

Charcoal iron	Tons 13,100
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Coke iron	41,200 = 61,300
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Blast for furnaces was introduced by Smelton about the year 1760, and the process of puddling iron invented by Coal in 1784, to which improvements are to be attributed the rapid progress in the iron manufacture towards the close of the last century. The production of pig-iron in Great Britain was as follows:—

1766 Tons 125,079	1800 Tons 248,851
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By the application of

below the uppermost works; the entire length to be driven will be 600 ft. The timbering and work in general is everything that it could be; it is without fault. The entire mine is provided with tramways, and the engine on the main Neptune incline and the whim on the Kempton incline are running day and night. From this top of the dump extends a double tramway down to the canyon. As soon as the tunnel reaches the vein, and the Bingham Railway is built to the mines, the ore will go direct by rail all the way out and from the mines to the Sheridan Hill smelters. The ore shoots of the mine can hold 300 or 400 tons of ore. On the dumps of the Neptune and Kempton Mines are at present over 4000 tons of second-class ore. The company has erected on the Neptune a large engine-house, carpenters' and blacksmiths' shop, and magazines, and in the Kempton a whim-house.

Down at the foot of the hill is a large comfortable house for the company's officers, also a smaller one, a nice office, and a stable for six horses. The Sheridan Hill smelter is situated in the best place it could possibly be. It has two reverberatory furnaces, four cupola and one roasting furnace. Sheridan Hill is situated on the Jordan River, and Bingham Canyon on Narrow Gauge Railroad, and by the United States Railroad it has telegraphic connection with every part of the country. The Sheridan Hill and the Neptune and Kempton Mining Company are two different companies.

W. BREDEMAYER, M.E.

THE CAMP FLOYD DISTRICT, U.T.—ENGLISH MINE AGENTS.

SIR.—I received this week a letter from General W. W. Lowe, of Omaha, Nebraska, who was over in England some three years since. He is a gentleman who can be thoroughly relied on. I have been acquainted with him for several years. He informs me that he has recently inspected the above district, where he holds a large interest himself in some of the principal mines. He writes—"The Camp Floyd Mill is now working on ores from the Queen of the West, Silver Cloud, and other mines of the district, and they are doing very well." He likewise sends me the following paragraph from the *Tribune*, July 27:—"Two silver bricks from Silver Cloud ore, Camp Floyd district, weighing 170 lbs., and valued at \$2694, came in on Tuesday."

The ore is from two mines, with which I am well acquainted, and have the conviction that, if worked with intelligence and perseverance, will eventually give this camp a name. As to the mines of the old Camp Floyd Company (Limited), suffice it to say that some American miners have taken tribute work, proving thereby their belief and conviction as to the future of this district. I should like to see the new English company, called the Camp Floyd Milling and Mining Company (Limited), show some practical faith by laying out 2000*m*. in prospecting the Sparrow-Hawk and Marion Mines. I am convinced, if this money is laid out with intelligence and conscientious economy, they will be rewarded soon with great success. The only question is—Do they know how and where to work?

I believe that after four years' close study of the district I ought to have some idea of where the next bonanza should be found.

Aberystwith, Wales.

HENRY SEWELL, M.E.

P.S.—I will soon be able to give you the promised information as to the Van Mine. I am a shareholder, and will inspect this mine again, after an absence of five years. I believe you will remember the letter I published in your Journal in 1870—about the great future of this mine, provided the directors backed Captain Williams in his views, which, fortunately, they have always done, and the results show the sagacity of giving fuller powers to mine agents, as also fuller salaries, for, as a general rule, no men are worse paid, more worked, and have less done for them than our brothers in mining, English mine agents. I brought this fact before your notice many years since.

MINING ON THE PACIFIC COAST—EASTERN NEVADA.

SIR.—In the Supplement to the *Mining Journal* of June 26 a letter appears under the above heading, referring to the vast mineral wealth of this State, and the wonderful discoveries recently made, and attributing as the cause of the success of American mining companies to the superior knowledge of American superintendents and miners. Question—Where was all this practical knowledge gained? Mr. Power informs your readers that a few short years since Nevada was designated the unexplored region, and it is a well-known fact that the Cornish miner was among the first to explore this hitherto unknown region, and develop its hidden treasures. The geological formation is of such a peculiar character that geologists are at a loss to account for it, as it appears like a vast upheaval, which is predominant throughout the State, with extensive veins of silver and gold-bearing quartz, varying from 6 to 200 ft. wide, encased in clay walls. It is evident your correspondent is prejudiced against the Cornish miner, as it is well known that he takes the precedence in metalliferous mining on this Coast, as well as every other part of the world.

The non-success of English companies is not attributable to the inexperience of English managers and workmen, nor from lack of mineral wealth existing in the country, but from the intrigues of American "sharks," disposing of exhausted or worthless mines to the over-confident English capitalist at extraordinary prices.

Gold Hill, Nevada, July 27.

EDMUND ROGERS.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—From what would appear to be conveyed by the chit-chat in City circles, a considerable amount of misapprehension exists as to the late lead epidemic which has for some time past adversely affected our weekly returns. It does not seem to be generally known that this sickness recurs each summer, and that this year it has invalidated nearly the whole of the experienced hands, the returns for some time past having been obtained by inexperienced labourers, nor does it appear to be known that this obvious drawback is but temporary, and that many economic improvements are expected to be forthwith introduced. The old invalided hands will, as usual, shortly be able to return to their labour, while the able and experienced hands, selected from Swanses and elsewhere on this side, have by this time reached the mines, the benefit of whose skilled services cannot fail to be made almost immediately apparent.

Again, it would seem to be imagined that the last half of the year bears unfavourable comparison in its results with the first six months, whereas just the opposite is the case. Last year, from August to January, by far the larger amount of the net results of the year were realised, and the present year will, no doubt, show a still more favourable comparison. Hauling and pumping capacity will have increased, and also the smelting power, while, by the completion of the railway, stores, fuel, &c., will be much more readily and economically supplied to the mine, increasing the productive capacity as well as the ratio of profit realised.

Again, the mine itself, especially in the recent explorations, has developed greater and richer bodies of ore than the most sanguine could have anticipated, and the works now in progress point to even yet further discoveries; while the important "development" of gold, reported to have been made in the adjoining Eureka Consolidated Mine at a much greater depth than the deepest point in Richmond, supports the opinion which has been expressed in well-informed quarters—that the percentage of gold that has been gradually increasing of late will prove to be a permanently additional source of revenue to the shareholders.

These are a few leading facts which should—I think officially—be brought within the ken of every investing holder of shares, as for interested reasons basely untrue statements are, from time to time, set on foot which, I think, whenever circulated, should be promptly met by an official contradiction.—AUG. 18. A SHAREHOLDER.

COPPER MINING ON LAKE SUPERIOR.

SIR.—I wrote you a few remarks [published in the Supplement to the *Mining Journal* of July 31] on mines and mining in this section of country—Lake Superior. You will please understand, however, my object is not to show up personalities, but to lay before the readers of your valuable Journal the reason why Lake Superior mines have not been attended with better success. You will have understood in the commencement of Lake Superior mining, and for some years, there was great contest even between geologists and the practical miner as to the true character of the lodes for the production of copper. The geologists plainly stated and felt confident that conglomerate belts would never be found productive of copper.

This, of course, is contradicted, as some of our richest mines have the conglomerate as a foot-wall. Look at Calumet and Hecla, and the once famed Minnesota and National Mines. Again, the idea prevailed for a considerable time that a lode simply charged with stamp-work would not pay. That is rock charged with fine particles

of copper such as could be broken up with hammers and put under a stamp. This theory have also been thrown aside in many instances, as it have been proved again and again that a lode simply charged with stamp rock of 2 per cent, for copper will pay handsomely. A multitude of such opinions and contests were afloat in early days, but I am pleased to notice that mining is brought down to a science here. This, coupled with economy, gives the capitalists an excellent chance for investment, and I am very confident the day is not distant when Lake Superior will flourish more brilliant than ever.

In my first letter I made mention of four or five mines which suffered through bad management, but having been placed on sound footing they are now on a very prosperous course, and such will soon be the case with the Allouiz Mine in Keweenaw county. About five years ago that mine started, and up to last spring they spent in assessment about \$900,000, besides the copper taken out. This state of affairs crushed many of its stockholders almost into the earth, but a change in the board was effected, a new treasurer elected, and a local agent appointed, which seems to have turned matters inside out and upside down, and brought things to a proper basis, or nearly so. The stamps apparently are located in the wrong place for water, and the present party is going back in the woods some two or three miles to bring in an additional supply of water. When this is accomplished there seems to be not the least doubt of being able to raise 100 tons of 75 per cent. of copper a month, which will give the stockholders a handsome profit.

The Huron and Isle Royal Mines, of Portage Lake, are two more gone down in that ruinous way, which if taken hold of in a proper spirit, similar to those I have named, could in a very short time be placed in a profitable position, having all the necessary machinery on hand, and the capital required could all be put in the development of the mine, and a small outlay only is necessary.

The Minnesota Mine, in Ontonagon County, is another one that has

been extremely rich for many years. This mine has been noted for its heavy masses of almost pure copper. One mass was taken out somewhere about 480 tons. Suffice it to say, at all events, I have seen 20 miners standing on it at one time, cutting it into pieces for the advantage of getting it up out of the mine, and for transportation. Masses from 5 to 50 tons were in sight and in course of getting out always until they reached the depth of something like 150 fms., when the lode simply showed stamp rock, with small pieces of what is termed here barrel work. This, with the upper part of the mine gone out of working condition, the company sold out, and the new company taking hold, thought it highly necessary to adopt a new kind of machinery for pulverising the stamp rock, spent a large sum of money in what proved a failure. I may say in less than two years they called in \$300,000, sunk but two shafts one level each, and stopped the mine. Tributaries applied to work on two-thirds of the copper, which was granted. They earned from \$100 to \$300 a month each man, but not being allowed to keep out the water, they, of course, only had a limited time in the deeper levels, but as the National is upon the same lode close by, having a deep adit, the water in the Minnesota, seems to find its way into the National about the 40, keeping the mine dry in that level, and many tributaries are working above that point, and almost coining money.—Portage Lake, July 27.

A MINER.

P.S.—Next week I will send you the amount of assessment paid in upon the different mines from the year 1845, being the commencement of copper mining on Lake Superior, up to 1872; also the amount of dividends declared, and other matters of interest.

TIN IN NEW SOUTH WALES.

SIR.—Some time ago you were good enough to insert a communication from me on the Sydney tin mining district. Having received another letter from my friend I send you extracts therefrom, and if you think them deserving a place in the *Mining Journal* perhaps you will give them publicity.

My friend writes—When I wrote you my last letter I had not been long in this country. Since that I have had the opportunity of inspecting a large extent of the tin-bearing districts, and, therefore, I am now able to give you a more general and reliable account. The very low price of tin is causing great stagnation here, many of the poorer claims are stopped, and the richer claims are keeping their works on short hands, and stocking all the tin they can, waiting for an improvement in the price. There are 200 tons stream tin to 1 ton of stamped, or raised from lodes; this stream tin is found in creeks and on high ground (alluvial). In the creeks the tin is found at depths varying from 2 to 12 ft., all of which has to be removed before reaching the wash-dirt, incurring great expenses. The wash is from 1 to 10 ft. thick, and varies very much in quality, yielding from little or nothing to 7 or 10 lbs. to the dish of 28 lbs., anything less than 1 lb. to the dish, or 80 lbs. to the ton, will not pay for working. Great difficulty is encountered in many places for want of water, which, however, is economical in every possible way. The size of the grains in the creeks are uniform, all passing through a No. 26 grate with very little fine tin, while in the alluvial or high ground they are very irregular, from the size of a walnut to fine tin. In the latter case the ground is rather tight for breaking, being almost as tenacious as cement, requires much labour to separate in water. The tin-bearing ground is about 150 miles long, running north and south, and is principally granite with patches of trap and sandstone cropping up. The latter contains a little tin, but not in paying quantities. The tin ground is irregular, varying in width from 1 mile to 8 or 10 miles. At Bundara, where tin was first discovered, from thence to Cope's Creek, a distance of 15 miles north, there is a good quantity of tin ground, which cannot be made available for want of water, although there are some claims working on a very small scale. Cope's Creek has been the richest deposit in the southern range, and the ground covers an area of 7 miles; large quantities have been returned from this place in the last three years, and still continues productive. In about two years at the present rate of working this deposit will be worked out. From this place to Middle Creek, about 8 miles, tin ground for 7 miles has been taken up, and much work done, without leaving much if any profit. Middle Creek was very rich, but is also nearly worked out. There is also one company still at work who, it is said, only paid one dividend of 1s. 6d. per share. From this place to Elsmore, about 8 miles, tin has been traced all the way, and some fine looking lodes laid open in the alluvial, all containing tin, and very promising to improve in depth. The lodes contain peach, quartz, mundic, and capel, with a good show of tin, but very little beyond a few feet sinking has been done to prove them. In the Elsmore district the MacIntyre rivers afford a plentiful supply of water, and will eventually become a large tin-producing district. About 35 miles from here is Vegetable Creek, which has been and continues very rich, although the water supply is deficient by means of dams and returning it again; as many as 600 persons are employed in the wet season. There is not much being done between this and Queensland: 12 miles north from the boundary, and in the same granite range, the Stanthorpe Works are returning large quantities of tin, and there are others beyond equally as good: 80 per cent. of the tin produced in this country is raised by private parties and tributaries. There are but few public companies doing much work, which, in a great measure, is due to the incompetency of the management and expenses attendant thereon. From personal observation I have no hesitation in saying there is a fine field for tin mining in the Sydney district, and with proper management good profits are certain to result therefrom.—Tavistock, Aug. 19.

A MINER.

CONVEX VERSUS CONCAVE BUDDLE FOR TIN DRESSING.

SIR.—While looking through the *Mining Journal* this morning I had my attention drawn to a letter therein on the above subject, signed T. H. Allen, asking mine agents whether it is necessary for them to have both the convex and concave buddles to perform the work satisfactorily, or if one is more suitable than the other, and which is the better budle of the two. Well, Sir, as he has asked a plain and practical question I think your readers should have a plain and practical reply. I find from personal experience that both buddles are desirable—the convex for extracting the tin from the rough or sand part, and the concave for dealing with the fine or

slime tin. And in the case of a new mine starting to work, or where the executive of an old mine has decided to lay down a new plant, unquestionably the both buddles can be introduced with advantage.

MINE AGENT.

COAL-CUTTING MACHINERY.

SIR.—In my letter to you, dated June 16, and inserted in the *Mining Journal* of June 19, I said that when Mr. Bass, jun., was here on June 7 to see Mr. Firth's Coal-Cutter at work I then made an arrangement with him that he should send one of the Gillott and Copley machines to cut in the same bank that he had seen the Pick machine at work in, and I then promised that you should have the particulars of the trial for your next number.

There has been some delay, but Mr. Bass sent the machine here on August 6, and on August 10 the Gillott and Copley left the surface about 1:30 P.M., and was taken to the Pass-by, within 250 yards of the bank where it had to cut, and was taken forward by a pony, five men, and a boy to the face, where Mr. Bass, son, Mr. Bass, jun., Mr. Copley (one of the patentees), Mr. Rayner, Mr. Cooper, and myself all arrived a little after 3 P.M., when the machine was taken off the carriage and propelled forward by men up the face of the bank to the top end, where a man had been at work making a hole 4 ft. long, 3 ft. 6 in. under, 8 in. high from the floor at the back side, this being requested to be done by Mr. Copley, and pronounced by him to be right. The work of putting the wheel on commenced, and after that the cutters into their places, with some other adjustments to make, the whole being under the superintendence of Messrs. Bass and Copley, and now pronounced to be ready for the compressed air, which was regulated for 40 lbs. It being now a little after 7 P.M. the air was turned on, and after several trials to cut the machine was broken, and the first day's trial a complete failure. Mr. Copley asked me to get the cutter to the top, so that some alterations might be made for the next day. At 1:40 the next day Mr. Bass, jun., and I went down and joined the men, who had taken the cutter down. Mr. Bass and the men commenced making the machine ready, Mr. Copley arriving about 3:30. The machine, being got ready, commenced cutting (or tried to cut), but after several ineffectual attempts Mr. Bass, jun., and Mr. Copley gave it up, and asked me to allow the men to take the machine out of the pit. My men had orders from the beginning to do whatever Mr. Copley wished them to do. Thus, after two days trial 3½ yards were cut, an average of 2 ft. 6 in. under. We then put Firth's Pick Machine to it, and without anything to do or any grubbing the Pick did the work in its usual style.

I give you this circumstantial account according to promise, and because there has been so much controversy on the subject, and I believe this to be the first time that the two principles have been tested in the Barnsley Thick seam.

WM. MADDISON,
Certified Manager.

Darton, Aug. 18.

CONSOLIDATED COAL.

SIR.—In the *Journal* of July 31 a very interesting account was given of the works of this company at Blythe-lane, Hammersmith. The patentee of the process adopted called my attention to the fact that although full particulars are given of the entire manufacture and the ingredients used, no mention is made that it is protected by letters patent, dated March 10, 1875, and taken out in the names of F. C. Danvers and J. H. Landon.

JAMES BELLAMY,
Secretary London and Provincial Consolidated Coal Company (Limited).

Hammersmith, Aug. 17.

FUEL ECONOMISERS.

SIR.—Whilst the late disastrous explosion of a fuel economiser is still fresh on our minds, it seems to me a fitting occasion to call the attention of all interested in this subject to the great necessity there is of seeing that every economiser is well provided with ample and good safety-valves, and that they be kept in good order. I am induced to do so by the fact that a great many thermometers are constantly brought to me for repair, broken not by violence or carelessness, or inherent defect in their construction, but by bursting from overheat. To give an idea of the rapid increase of pressure with increase of temperature, I would remind your readers that—

21° = 1 atmosphere = 15 lbs.	20° = 4 atmosphere = 60 lbs.
25° = 3 " " = 30 lbs.	37° = 12 " " = 180 lbs.
27° = 3 " " = 45 lbs.	43° = 20 " " = 300 lbs.

So that it will be easily perceived how extremely dangerous it is to allow the temperature to continue increasing without a sufficient outlet being provided for the escape of steam formed. Well known as the above facts are, it is not a little remarkable how difficult it sometimes is to convince persons that thermometers, under these circumstances, really burst from excess of heat. Most of them range to 350° or 400°, some even higher, and when these break by bursting at the bulb we may be quite sure that the heat of the water or steam in the economisers must be very great, and the pressure in proportion. Pressure represented—say, by 400°—is very considerable, as I have shown above, and if there be any imperfection in any of the pipes, an explosion is unavoidable. I cannot help thinking that the fact of so few accidents occurring speaks well for the general soundness of economisers. Nevertheless, I believe few are aware of the enormous pressure sometimes generated in them, as shown by the fact I have already stated of thermometers bursting, although made to register so high a temperature as 400° or more. If the valves are kept in good order, and are sufficiently ample, the danger is almost eliminated. The pipes should also be made sufficiently strong as to stand unforeseen pressure.

J. CASARTELLI.
Market-street, Manchester.

THE DIVINING ROD.

SIR.—I presume the instances of the inefficiency of the dowsing rod, given by Mr. R. Symons, in last week's *Journal*, are quite as well authenticated as is that of Mr. Y'Gwyr in favour of it. I recollect seeing the rod used some years ago in Gwennap, when, although it distinctly bent—or was bent—downwards, no lode was discovered, nor was any quantity of water found. On the strength of the rod, and other indications, four trial shafts were sunk and cross-cuts extended north and south, but the attempt was, after a time, entirely abandoned. In the *Journal* of July 31 Mr. Tregay criticises my letter at length, but his manner of criticism is somewhat peculiar. Saying very little of the real subject of discussion, he flies off at a tangent, fairly losing himself in a maze of his own creation. Whilst he proves nothing himself, he asks me to demonstrate everything. He does not give a single valid reason for stating that the dowsing-rod is not a delusion—his only plea for it is its antiquity, and even this is not distinctly established. The only thing in connection with it that we are sure of is that it has descended from some old Druidical ceremony.

I stated in my letter that Science forbids the dowsing-rod idea—is Mr. Tregay prepared to show that science admits of it, and to show in what way and under what circumstances, and to give any intelligible reason for the action of the rod in pointing out mineral deposits? If so, then the proof may be easy—if not, all argument avails nothing and is lost time. Mr. Tregay informs us that "N.B." remarks are not consistent with "sound reasoning." There are two kinds of reasoning—one proves a false and erroneous assumption to be true, by making use of a fact inapplicable to it; the other proves a correct statement. The first is unsound reasoning, because starting on a wrong basis all the arguments adduced are unsound. Mr. Tregay professes not to be able to discover the analogy between the dowsing-rod and witchcraft and astrology. His chief plea in favour of the rod was its antiquity, and the antiquity of witchcraft and astrology is not to be disputed.

AUG. 21, 1875.

in nearly an unbroken sheet of 8 or 9 miles in length, to the upper part of the River Mawddach; and at Rhobell fawr it is more than 2 miles wide, rising in broken and bare undulations to the very top, near which it is overlaid by a short strip of highly porcelainised slate. On the south-east side of Cader Idris, and east of the Arans, are beds of black slate, forming probably beds of passage from the Llandeilo flags to the Bala beds. In places they contain *Orthis Actonia*, *O. bifurata*, *Lepidora quinquecostata*, with trilobites of the genera *Asaphus*, *Ampyx*, *Cybele*, and other fossils. These in turn are overlaid by undoubted Cardioceras or Bala beds, in the midst of which lies the well-known Bala limestone, which, beginning at Dinas Mowddwy, in interrupted faulted lines, stretches north by Bala across the broken hills south of Cerrig-y-Dreidion, and from thence westward to Penmachno. Throughout this course, on two or three horizons, this highly fossiliferous limestone is overlaid by certain thin bands of felspathic volcanic ash. The limestone itself is sometimes slightly ashy.

It was long ago proved by Prof. Jukes and Mr. Selwyn, from the physical structure of the country, that the fossiliferous calcareous ash in the valley of Dolwyddelan is the equivalent of the Bala limestone, and the great mass of felspar-porphry that lies below this ash, between Dolwyddelan and Yr Ardu, is clearly connected with the volcanic operations that produced the thin ashy beds underneath the limestone at Bala. The western end of the Dolwyddelan porphyry is only separated from the great masses of porphyry that form the chief components of the Snowdonian range by a narrow anticlinal axis of sandstone and slate, full of the ordinary Bala fossils. The rocks of Dolwyddelan lie, indeed, in an elongated basin, which is an outlier of the greater basin of which Snowdon forms the centre. This larger basin is well worthy of notice. If we follow the geological lines from Moel Hebog to Carnedd Llewelyn we find, on a great scale, that the structure of the country precisely corresponds to the minor basin of Dolwyddelan. On the south, east, and west of Moel Hebog, there are fossiliferous sandstones and slates of the Bala beds, overlaid by felspathic porphyry, on which are thick beds of calcareous ash, forming the summit of the mountain, and corresponding to the ash of Dolwyddelan. It is therefore, in part, at least, the equivalent of the Bala limestone. The porphyry of Moel Hebog ranges north to Snowdon in an unbroken line, and there again, between Snowdon and Tewl-du, below Yr Ardu, it is overlaid by the very same ash, which in places, as on the top of Snowdon, becomes partially slaty and fossiliferous. It is a remarkable circumstance that the rock forming the very peak of Snowdon lies in the centre of a basin. Another patch of these ashes lies in the valley of Nant Gwynant, surrounded by the same porphyry. The basin of volcanic rocks is here over 5 miles wide, from the hills on the east side of Nant Gwynant, where the rocks dip N.W. to the Pass of Llanberis, where they dip S.E. All these Snowdonian porphyries are true Silurian lava bedded, accompanied by volcanic ashes of the same period. They are perfectly interbedded with fossiliferous strata, and it is worthy of remark that the slates on which the porphyries rest have been altered at points of contact by the overflowing melted masses, whereas the slaty beds that rest upon them having been deposited on cooled surfaces, are unchanged by heat.

With the exception of few small dykes, all the greenstones of North Wales are of Lower Silurian age, and strictly intrusive. Sometimes they occur in bosses, and sometimes in broad dykes cutting across the other rocks; but frequently, having been injected between the beds, they run in long lines, parallel to the strike of the country, and for a space partake of the curvatures of the strata. Under such circumstances it would be easy to mistake interbedded lines of greenstone for lava beds, were it not that the slates and shales in contact with the greenstones, both at their upper and under surfaces, have been alike altered by heat.

Between Snowdon and Yr Glyder-fawr and the Menai Straits, blue slaty Silurian strata rise to the north-west. The base of these, interbedded with grit, forms the Lingula flags beneath which lie the Cambrian grits and purple slates, in which are the great slate quarries of Llanberis and Penrhyn. In a low part of the blue slates mentioned above, a little higher than the Lingula flags, is the position in which we might expect to find the equivalents of the interbedded volcanic rocks of Cader Idris and Moel-wyn; but they do not occur west of the Snowdon range, having all thinned away deep underground in the synclinal curve that forms the Snowdon basin, and Bala beds and Lingula flags have also thinned to something like half the thickness they attain between the Merionethshire Cambrian grits and the Bala limestone near Bala. Part of the foregoing remarks show that in the Lower Silurian epoch in what is now Wales, there have been two periods of volcanic activity. The oldest of these, during the deposition of the Tremadoc slates which lie low in the Llandeilo flag series, is marked by the interbedded porphyries and ashes of Cader Idris, the Arans, the Arenig, the Manod, and the Moel wrys. The second, which occurred during the Cardioceras or Bala period, is separated from the older porphyries by from 4000 to 6000 feet of intervening strata of the Bala beds, in the higher parts of which lie the porphyries and ashes that range from Moel Hebog to Conway, and form the great Snowdonian chain. In all these areas no traces of the original craters remain from which the volcanic products found vent.

The Silurian slates and sandstones, with their interbedded igneous rocks, are so old, and have been so thoroughly disturbed in wide sweeping curvatures after the close of the Lower Silurian period—besides which, the whole country has suffered so much from denudations that all traces of the original forms of the volcanoes have long since perished. But though the craters have disappeared, there are among the rocks that underlie the lavas and ashes many bosses of intrusive felspathic porphyries, syenites, &c., and doubtless some of these are the deep-seated nuclei of melted matter which underground were connected with volcanic vents, from whence the lavas poured.

Examples occur in the syenite of Festiniog, the quartz porphyry of Llyn Padarn, and in the Rivals and other intrusive bosses that give such a beautiful outline to the long promontory that forms the north horn of Cardigan Bay.

T. A. READWIN, F.G.S.

London, Aug. 12.

THE DIAMOND—No. IV.
If thou be a king, where is thy crown?
My crown is on my heart, not on my head:
My crown is call'd content:
A crown it is that seldom Kings' enjoy."

SIR.—By way of pause between the consideration of cut and uncut diamonds, the latter of which will now be canvassed, a convenient opportunity presents itself for reference to the constitution (physical) of the British crown. Unable to obtain the relative weight of the gems by which it is garnished, the description of this gorgeous diamond must necessarily be rendered in number and money value. Round the circle are 20 brilliants of 1500*l.* each—30,000*l.*; two centre diamonds are valued at 2000*l.* each—4000*l.*; 54 small ones, placed at the angle of the former, 100*l.* There are four crosses, each composed of 25 brilliants, estimated at 12,000*l.* together with four large ones at the top of the crosses, 4000*l.* In the fleur-de-lis are set 12 of these precious stones, 10,000*l.* and 18 smaller ones, 2000*l.* Pearls, diamonds, &c., upon the arches and crosses, 10,000*l.*; also 141 small diamonds, 500*l.*; 26 diamonds in the upper cross, 3000*l.*; together with two circles of pearls about the rim, 300*l.* Total value of the gems in the crown, exclusive of cost of gold and expense of manufacture, 75,900*l.* So complete was the clearance of valuable portabilities, immediately antecedent to the usurpation, that the whole of the diamonds attached to the crown were only estimated at 168*l.* whereas it is recorded that "in the first year of the reign of Charles I., anno 1625, the king's jewel office contained an immense quantity of jewels, gold plate of divers forms, as feathers, flowers, collars, composed of diamonds, rubies, sapphires, &c." At a very early period of the world's history the diamond was known and held in very high estimation, but up to the year 1385 it must have been worn or exhibited as an unwrought stone; even in its crude state, compared with a brilliant as a crystal to a fully-developed butterfly, it had assigned to it in Pliny's time a superiority over all other gems. Indicative of the high estimation in which the diamond was held, even in its unpolished state, in the middle ages, it may be noted that the imperial mantle of Charlemayne (A.D. 800 to 840), and which is still preserved in the French metropolis, is ornamented with clasps containing uncut octahedral crystals. Of uncut diamonds, though some kind of mystery hangs about its true condition—i.e., whether it remains in its original state or has been subjected to some imperfect cutting, the diamond appertaining to the Great Mogul is accredited as being the largest real stone. It is represented by some as being uncut, weighing 779 or 900 carats, by others as indifferently operated upon, being of the size and shape of a hen's egg, and cut in the rose form, and now only realising in weight 279 9-10ths, or, again, 296 carats. It is, as we have already seen, stated to adorn the imperial sceptre of Russia, but, somewhat like the fly in amber, it is unable to state how it got there. It is evident this gem has shared the fate of most others of its kindred, we are in possession of no evidence in relation to its present existence; and, therefore, what I have previously stated must, I fear, be taken *cum grano salis*. A very large diamond is said to be in the possession of the Rajah of Mattan, in Borneo, where it was discovered some 135 years ago. Its weight is supposed to be 367 carats. The Governor of Borneo, anxious to obtain possession of it, offered for it the sum of \$150,000, and to carry out negotiations proposed to add two large war brigs, with the complement of guns and ammunition, together with other guns. The Rajah, despite of this tempting offer, declined, on the plea of depriving his family of so valuable an hereditary treasure, to which the Malays attach the miraculous power of eradicating all diseases to which humanity is heir, for they conceive the notion that water into which it is inserted becomes a panacea against all ailments; and, further, that the family of the possessor holds an immunity against all pecuniary and political adversities.

Next in order, with regard to weight, of the uncut stones was found at Golconda. It weighs 340 carats. The "Great Table," which was interviewed by Tavernier at Golconda in 1642, weighs 242½ carats. Being on sale at the time with a reserved price of 500,000 rupees, that enterprising traveller made a fruitless offer of 400,000 rupees for it. There remains but one other stone of which I can obtain any reliable information. This, though strictly speaking not in the rough, appears an India—therefore imperfectly cut—rosette,

weighing 193 carats, and is further disfigured by exhibiting a faint yellow tint.

Of the English collection of diamonds, none possess the interest and afford the instruction as the finely collated series in the British Museum, and I may be here allowed to refer to the intelligence which guides and the civility and attention which distinguish the curators of that national institution. In every branch, from the chiefs of each department, one principle obtains, that is to afford every facility for obtaining information. Whether in the library for literary information, or in the various museums, one uniform attention is paid. Much more might be advanced upon the character of the diamond in the light I have taken, but I hesitate to produce it, as I feel that it would be only treading, as already done, upon hypothetical ground. Jealousy guards a certain portion, lapse of time another, and the third is rendered mystical by tradition. In my next I propose to enter into the consideration of the geology, chemical character, and locality, and, by way of conclusion, add some hints for the discrimination of real from fictitious gems. W. WHITE.

Laboratory and Assay Office, 25, Finsbury-place, E.C.

"ARGUS," AND "A" AND "B" CONSOLS.

SIR.—He must indeed be a novice not to know the mines alluded to by "Argus" in last week's Journal, but I cannot help thinking "Argus" must be a still greater one if he entertains the idea for a moment that the South Condurrow shareholders will dream of amalgamating with Grenville in their present position. Who "Argus" is I know not, but as he gives us the benefit of a hint, though only telling us what we all knew before—that Grenville is raising about 15 tons tin per month, and making calls—South Condurrow, on the other hand, is raising 40 tons, and paying dividends, I will give "Argus" the benefit of a hint, and say—"Go thou, and do likewise." When that convenient season has arrived we may take his advice into consideration—certainly not before.

London, Aug. 17. A SOUTH CONDURROW SHAREHOLDER.

CORNISH MINING—"A" AND "B."

SIR.—The letter of your correspondent "Argus" in last week's Journal, is intended, I assume, to refer to Wheal Grenville and South Condurrow Mines. I do not doubt the disinterestedness of "Argus's" communication, but I cannot help thinking that, whilst his statements are most satisfactory as regards Wheal Grenville, the South Condurrow adventurers will hardly thank him for his reflections upon the management of their property, or for his candid admission as to its future prospects.

The substance of "Argus's" letter is that "A," which I assume means South Condurrow, returns 40 tons of tin per month, but "has power and means of returning double the quantity if the stuff could be got," but at the 90 fm. level the lode goes out of the mine, and enters "B," or Wheal Grenville, at which mine there is at present an insufficiency of pumping and stamping power. "Argus" therefore proposes to amalgamate the two unequal circumstances, or, in other words, to join South Condurrow, where the stamping power is more than sufficient, but where the lode is of limited extent, with Wheal Grenville, which has insufficient machinery, but an unlimited supply of the "stuff" necessary to make a profitable and lasting mine.

"Argus" thinks that this would be an excellent arrangement, and no doubt it would—for the South Condurrow adventurers—for "Argus" shows that, from the short run of ore ground in that mine, the 30,000*l.* yearly profit which he maintains as likely to be made must of necessity arise out of the Wheal Grenville ground, and the latter adventurers are asked to share this probable future profit with the South Condurrow adventurers because the latter have erected more stamping power than they have use for! If the proposed amalgamation were carried out it is extremely doubtful if the South Condurrow stamps would ever be of any advantage to Wheal Grenville; the pumping power most assuredly never would, because at the 130 fm. level, from Wheal Grenville north shaft (the shaft nearest the boundary of the two mines), the lode is 17 fathoms from the boundary, and as it underlies nearly 2 fms. in 1 at the 140 fm. level it will be nearly 27 fms. into Grenville, and go on increasing in like manner in every 10 fms. of sinking, so that the South Condurrow pumping-engine can never be of any use to Wheal Grenville.

Now, I am satisfied that the pumping and stamping power at Wheal Grenville are ample for the present operations, which it would not be advisable to extend in the depressed state of the tin market. When our agents tell us that the time has arrived for the erection of more power, I, as one of the adventurers, and having great faith in the future of the mine, shall cheerfully contribute to the expenses, because I shall feel from the past cautious conduct of our agents that they would not advise it if the improved prospects of the mine, coupled with a better price for our produce, did not warrant the expenditure. I should prefer this to amalgamating with an adjoining mine, where, as "Argus" says, "Profit can only be made so long as the comparatively shallow ground lasts." Besides, if, as "Argus" tells us, "A," or South Condurrow adventurers, have erected extensive and expensive machinery with only a limited extent of lode there may probably be no use for any portion of the machinery at no far future date, and if so it exhibits extravagance and folly on the part of the South Condurrow management, which the Wheal Grenville adventurers will do well to profit by, and not increase their pumping and stamping power until the occasion fully justifies it, and they are well assured that a long future of success will attend upon the outlay.

Aug. 18.

WHEAL GRENVILLE AND SOUTH CONDURROW.

SIR.—I notice a letter in last week's Journal from your old correspondent, "Argus," in reference to mines which adjoin each other in Redruth. It is impossible to doubt that it refers to Grenville and South Condurrow. The remarks that he makes are so true, and the inferences he draws from the result of the union which he advocates are so certain, that I trust the shareholders in both mines will take action without delay. The advantages in the future to Condurrow are so manifest, by giving them a participation in the lodes in Grenville, now proved to 160 fathoms. In simple fact, an imaginary boundary divides into two properties that which ought to be one commonwealth.

Cornwall requires now much vigour of action to prevent its founders in the waves of trouble which threaten to submerge it, and it will be lamentable if private interests and old routine should deter new light and fresh life from coming to the rescue of undertakings which otherwise may speedily succumb.

VIATOR.

GROGWINION LEAD MINING COMPANY—AUDITORS.

SIR.—"A Shareholder" says that he would do the work of the directors for one-third the money. I have no doubt that he would—as far as lay in his power. He may be a member of the Institute of Accountants for ought I know; indeed, I think it very likely that he is, for some of their members have lately undertaken to do for 10*l.* that which no reasonable being could do for about 50*l.*, but then, perhaps, your correspondent is as fully justified in ranking himself as an auditor as many members of that Institute whose audit would be useless at any price.

AN AUDITOR.

AUDITING OF MINING COMPANIES' ACCOUNTS.

SIR.—When I offered a few remarks on the above subject I was speaking of the absurdity of mining companies appointing amateurs instead of accountants for their auditors, and of the smallness of the sum usually voted for their services. In the letter of "A City Man" no company's name was mentioned, nor was the amount of the remuneration of the legal auditor he was alluding to stated. Being, however, from subsequent letters enlightened on the subject, I can now well understand how even a lawyer could be tempted to assume the duties of an accountant. The cause that has given rise to this correspondence shows how little shareholders know what an auditor's duties are, or what would be a fit payment for them. Having had much experience in companies accounts, and gone through many sets of books and papers with auditors, both amateur and professional ac-

countants, I can safely say that the amateur's supervision is of little use, very few of them understanding even the common principles of book-keeping. Common sense should surely tell anyone that to audit accounts an accountant is the proper person, not a lawyer, a military officer (often selected), or even an esquire.

With regard to remuneration, while 50*l.*, as in Grogwinion, is an absurdly large sum to give, yet three or five guineas, as paid by many companies, is far too low. Ten guineas would be a fair and honest remuneration for most small companies, while in no large British dividend mining company would the work be so great but 20*l.* would pay well for it. In large foreign mining companies the details of accounts are usually heavier, and a little more than 20*l.* would not, perhaps, be too much. For mining companies I consider two auditors quite unnecessary. When two have been appointed I have usually found one did the work (the accountant, if one was an accountant), while the other simply talked, looked on, and added his signature to the sheet as correct—at least, such has been my experience.—*London, Aug. 19.*

AN ACCOUNTANT.

MARKE VALLEY MINE.

SIR.—Having noticed for some time past the improved appearance of this mine from the reports published in the Journal, I decided to have it inspected by a good, independent agent. I send herein a copy of the report by Capt. A. T. James, of South Frances Mine, and I am glad to say that it confirms the improved reports of the agents of the mine. During the present depression of mining in Cornwall, it is really refreshing to find an old mine like Marke Valley, which has returned good dividends in the past, at again to come into the Dividend List.

The mine is only now selling for 18,000*l.*, with the prospect of a very early resumption of dividends, whilst anyone who carefully reads Capt. James's report will say that the present price ought to be 20,000*l.* The new shaft will be down to the 20 in four months, when the returns will be considerably increased, and the expenses at the same time very much decreased. The present returns are 350 tons a month, and when the new shaft is completed they ought not to be less than 450 tons monthly, which at the present low price of copper would leave a profit of 600*l.* a month. But copper is now on the rise, and should it continue to rise the profits will be considerably increased.

The balance in hand at the last meeting was 1200*l.*, which will probably be increased to 1800*l.* in October, when a fair dividend could be declared. I see no reason why in a short time this mine should not again pay 2000*l.* a quarter in dividends as of old, when the shares were 12*l.* each, whereas the present price is only 2*l.*

Please to publish the enclosed report at the foot of this letter for the information of numerous Marke Valley shareholders.

Aug. 16.

A SHAREHOLDER.

MARKE VALLEY MINE.

Redruth, Aug. 6.—I have inspected the above mine. The following are my views with respect to its intrinsic value, and the present mode of working:—The engine-shaft is sunk about 10 fms. below the 136. The 136 is driven west of shaft about 50 fms., the lode in the present end is about 2 ft. wide, producing shoots of copper ore, and apparently undergoing a favourable change. The rock is softer, and more congenial, and the lode presents a promising appearance. About 40 fms. before this end in the 80 and the levels above a new run of copper ore has been discovered of great promise, and this end is being driven in virgin ground, with a fair chance of intersecting this fine run of ore, which at present seems to be the most prominent point in the bottom of the mine. The 70 is being driven west of the old boundary into West Rosedown sett, the greater part of which the present company have acquired; and judging from the very promising character of the lode, it seems to be a very important acquisition. From this level to surface (about 120 fathoms) the prospects are of a most hopeful character. The level is being driven on north part of lode, which is producing stones of ore, but the south part is not yet driven through; here a few fathoms behind this end a good lode is discovered, and is being driven through, and extensive sections of profitable ground laid open for stamping, both in the back and bottom of this level. In the 60 west the lode is about 6 ft. wide, the north part is about 3 ft. wide, very soft, and is worth 15*l.* per fathom, presenting a very promising appearance. In the 50 west the lode is 4 ft. wide, the south part producing gossan, and the north grey and black copper ore of rich quality, worth 18*l.* per fathom. In the 20 west the lode is 6 ft. wide, the north part producing gossan, and the north grey and black copper ore of rich quality, worth 18*l.* per fathom. The new shaft will come down about 20 fms. to the east of this end, and when communicated to this level it will enable the agents not only to increase the return and good profits, but also to work the mine in a proper and more efficient manner. From the back of the 120 to the bottom of the 50 several good stopes and tribute pitches are under operation, which I need not here detail. The following remarks are the result of my inspection:—First, the mine is slowly, and rather expensively, worked, in consequence of having to throw all the ore from the level above the 60 down to that level, which is then driven and down to surface. The men have also to go down to the 60, and climb up to the 10, and vice versa, which makes it rather tedious, but this will be obviated in about four months from this date. Secondly, the future of the mine seems to wear a cheerful aspect, and I am thoroughly satisfied the prospects are very good, especially when we consider that all the levels above the 20 are productive, and are being driven in virgin ground of a most congenial character. This in itself may be considered a new mine of great promise

find opportunity to point out several valuable properties of this nature, and to prove that the treasures of unworked lead in the British islands are of great magnitude, of rich value, easily accessible, and capable of being worked with remarkable economy.

Permit me, once more, to call your attention to an investment worthy of notice. On former occasions I advocated the Chapel House Colliery as a very secure and eligible investment. Coal mines will always be so, for although the trade in coals must have its fluctuations as well as all other trades, there must always be a demand, and a remunerative one. Coals are now considered low, at all events by the owners of collieries, but in September householders begin to lay in their winter supplies, and coal merchants to renew their stocks. Chapel House Colliery is, however, situated in Lancashire, where the demand is always active, the consuming energy of factories, foundries, and ships never abating, besides the millions of population requiring it for household purposes.

Coal in any part of the United Kingdom is a profitable investment. As metals move the world this mineral moves the metals. Charcoal cannot take its place, forests fall before the arm of civilisation, but the wider civilisation spreads the more eagerly the coal measures will be sought wherever they may be found.

At the present the Chapel House Company are obliged to purchase coal to satisfy the eager demand of their customers, which cannot be met fast enough by the "output" from the pit. The mine is within 15 miles of Liverpool, every facility of transport exists, and the company's plant, service of wagons, barges, &c., is as complete as in the case of any other colliery of equal extent in the kingdom. It is especially worthy the observation of persons seeking investment that dividends are being distributed at the rate of 15 per cent. per annum.

Finally, I can recommend, conscientiously and firmly, our clients, friends, and the public, to purchase shares in the Chapel House Colliery Company (Limited), Ormskirk, Lancashire. Accept my thanks for your courtesy in opening your columns for my communications.

Royal Exchange Buildings, July 19. GEORGE BUDGE.

BRITISH MINING.

SIR.—I read with great interest your article on the present position of the stock and money markets, and I consider that the attention of your numerous readers, who take, I doubt not, a deep and lively interest in mining, particularly British, should again be brought to the real point at issue—the investment of their money in that branch of industry in their own country which is likely to best remunerate them. Your remarks on telegraphs and railways require no comment from my pen, but I do think that a fair field is open for that on mining. I will ask your readers to look fairly at, and weigh without prejudice the price of many of our progressive British mines. Take, for instance, West Tankeville and Parry's Mountain, and a few others, whose recent meetings and reports show how well their affairs are managed, and how much interest is displayed by their directors for the good of the shareholders. Now, such being the case, I consider there is at the present time a far better investment in these companies at the low price of their shares than that of placing money on deposit at a bank, buying a railway stock or doubtful foreign bond at their high price.—1. The investor in a British mine is enabled at a small cost to visit his property and see for himself.—2. The price at which most of these shares can be bought is about one-third of their issue price.—3. The outlay that has been made on these properties greatly enhances their value, and in the future there is every reasonable belief in their ranking with those mines whose shares command such handsome premiums. In mentioning the mines I have taken them as a good criterion for others, and would recommend a perusal of their balance-sheets as the best guide for investors.

Of one thing your readers may be assured—a low-price British mining share of a well-conducted mine presents (with small risk) at this time one of the best and soundest investments offered to the public. I am not a shareholder in either of the mines I have mentioned, but after reading your remarks in last week's Journal I thought some notice should be taken by those who have an interest in the mineral development of their country. Would that a greater portion of the capital that is now, I fear, lost in foreign loans had been expended in British mines; not a tenth part of the ruin and misery that have been caused would now be deplored. I notice copper and lead are both improving in price. W. B. F.

London, Aug. 19.

PRINCE OF WALES MINE.

SIR.—There is not much upon which to congratulate the adventurers in the last four months' working of the mine. They have realised copper ore—589. against 963. in the previous period; but they have sold more mudiic, and gained about 93. under that head in comparison with the previous account. The arrears of calls are rather less, and this is about all on the favourable side. The monthly loss has been 161. against 210. in the previous six months. The mudiic, from which so much was hoped in certain quarters, has cost more to extract than it can be sold for, the agents paying 12s. 6d. or 15s. per ton for working it, while the sales have been made at an average of little more than 11s. So far as the adventurers are concerned they would have been better off if the mudiic had been left in the mine. The policy of waiting upon Providence for something to turn up has thus once more ended in disappointment. Thanks to your insertion of my previous letters, the shareholders have begun to remonstrate with the committee, and a movement is now started which is more hopeful in its prospects than anything that has been done lately. The committee are going to look into the matter of working the abandoned portion of the mine. Preliminary steps are being taken towards this end, and if this course is steadily pursued it will probably result in placing the mine in a much better position than it has occupied for some time past. The expense of a new engine will have to be met, and the shareholders must pay attention to their interests, and themselves help to rescue the adventure from the Slough of Despond into which it has by their own apathy been allowed to fall. The apathy of the adventurers causes apathy in the committee and elsewhere—all around, in fact. The mine is a poor one, which can only be made to pay a moderate return by the closest attention of all concerned to see that it is worked in a business-like and economical way in every department. The adventurers are told at one time they have a most valuable property for silver, at another for tin, now for low-class copper ores, which are to bring more riches than the highest standard, and then for mudiic, which is to retrieve everything. They will do well to pay no heed to such sayings any longer, but give their attention to the steady, miner-like development of their property, and in that they will be likely to find their best reward.

COPPER.

BOILING WELL MINE, NEAR HAYLE.

SIR.—In these depressed times in tin mining, in this county and elsewhere, I think capitalists would do well by paying attention to several comparatively shallow mines that, in all probability, would pay as well as most of the productive mines in Cornwall if developed, which are now idle for want of capital to prove them—the Boiling Well Mine, for instance. This mine is situated to the north of the celebrated Great Wheal Alfred and the Alfred Consols Mines, and is traversed with the same cross-course and floor, about which the lode has yielded such an immense wealth in the one and other mines, that is so well known that it requires no comment from me. Suffice it to say that the strata in the Boiling Well Mine are everything that could be desired for the production of rich silver-lead, as well as rich copper ore. One of the greatest mining authorities that this county can boast of says that the Boiling Well Mine resembles the East Wheal Rose, Shepherds, and other mines where blende and lead, with copper ore, have been found on east and west lodes. It is my opinion, Sir, that the western part of this mine, in proximity to the cross-course already referred to, will prove very productive for rich silver-lead, as there is a slide of great extent above which most all the mineral from this mine has been raised, dips rapidly west towards that point. The strata under this slide is more congenial for the production of copper ore.

The mining engineers who have from time to time inspected the property agree that it would make a deep and lasting copper mine if developed. Mr. George Hawwood, M.E., says—"After a careful examination, I cannot but come to the conclusion that the Boiling Well Mine will prove to be a deep and lasting copper mine; the stratum is favourable to such a supposition." He adds—"I firmly believe that beneath the slide alluded to the vein will be found to be capacious, and that the 80 fm. level will give a preponderance of copper ore; the lodes are well defined and continuous." I would here remark, Sir, that the late company sunk the shafts from the 50 to the 72, and sold blende, silver, and copper ore to the value of

more than 25,000. And, like other mines in this district, had to be closed for want of capital to develop its mineral resources.

Although Great Wheal Alfred and Alfred Consols had given such immense profits most of the minerals in these mines were raised from much deeper levels than the deepest point in Boiling Well, which is only 72 fathoms from surface. There are side lodes of great promise standing wholly from the adit down, and there are cross-outs driven from the bottom level to within a few fathoms of these lodes, but stopped short before reaching the desired object.—Aug. 19.

MINE AGENT.

[For remainder of Original Correspondence, see to-day's Journal.]

GREETINGS OF PUBLIC COMPANIES.

PATENT COTTON GUNPOWDER COMPANY.

The adjourned meeting of shareholders was held yesterday at the offices, Queen Anne's Gate, Westminster. Major JOHN RAMSAY L'AMY (chairman of the board of directors) presided.

The CHAIRMAN, in opening the proceedings, remarked that he had little to say further than to tell them that this meeting was held legally to confirm the resolutions agreed to at the last meeting if it pleased them. The Companies Act defined that the confirmatory meeting should be held within 14 days, and the shareholders to-day had been called together for that purpose. On the last occasion one or two gentlemen had desired to be further informed upon two points—one, the cost of manufacture, and the other as to the patents. He then read and laid on the table full statements showing the exact cost of manufacture, and showing that that cost would vary in proportion to the quantity manufactured, as stated on the last occasion. He might say that while in September, 1874, the product of the manufacture was only 27. 13s. 9d., it had rapidly and largely increased since the demonstration at Faversham in February last, since when the orders had been—March, 295L; April, 321L; May, 381L; June, 410L; July, 481L; and up to that day in August, 785L. 3s. The Chairman concluded by moving that the resolutions passed at the meeting on July 3 be hereby confirmed and adopted:

1.—That the company be wound up voluntarily, and that Commissary-General R. M. Gardiner and Major-General Robert Barlow McCrea be and that they are hereby appointed liquidators for the purpose of winding up the company voluntarily, and that they be authorised under the 161st section of the Companies Act, 1862, to carry out the arrangement referred to in the Chairman's circular, dated July 17, 1875, or any other arrangement which they may deem expedient within the limits of that section.

2.—That a new company be formed with a capital of 30,000L, in 15,000 shares of 2L each, to be entitled The New Cotton Powder Company (Limited).

3.—That the whole of the property, assets, and liabilities of the present company be transferred to and assumed by the new company.

4.—That in consideration of such transfer the shareholders of the present company shall receive for each of their present shares one fully paid-up share in the new company, to be distinguished as B shares.

5.—That 5000 other shares of 2L each in the new company be to be subscribed, and to be paid for by instalments, and distinguished as A shares, shall be entitled to a preferential dividend of 10 per cent. per annum, with equal participation in all profits beyond.

MR. DUNLOP, in seconding the motion, said he had gone carefully into all the details submitted to the meeting. Most of them he had verified absolutely, and the rest he believed to be accurate. He believed that the speculation was one which, if worked out well and resolutely by the directors, could not help succeeding. They only wanted 5000L, and he with the directors were willing to take their share of that amount.

Gen. GARDINER said they ought not to lose sight of the fact that the foreign patents would of themselves recoup the shareholders for every penny of expenditure.

The CHAIRMAN made a statement showing that the Irish agency was in a very promising condition.

A conversation then followed, in which Major-Gen. M'Crea, the Rev. John Fawcett, General Gardiner, Mr. F. S. Joseph, and other shareholders took part; after which the resolution was carried unanimously.—A vote of thanks to the Chairman terminated the proceedings.

BETTWS LLANTWIT COLLIER COMPANY.

The adjourned meeting of the shareholders of the above company was held, on Wednesday, at the offices, No. 4, Lothbury. It will be remembered that the meeting which should have been held on August 11 was postponed, as the necessary quorum for the transaction of business was not present.

The CHAIRMAN said that before he proceeded to make any remarks upon the working of the colliery he would allude to the cause which had led to his filling the chair on the present occasion. Some months since the worthy chairman, Sir W. Brett, sent in his resignation, owing to the large amount of work which he had to perform in connection with some business matters in the country; for a long time the directors endeavoured to persuade him to remain, but were, unfortunately, compelled at last to accept his resignation, and therefore he (the speaker) appeared before them to-day as chairman, and would endeavour to lay before them the facts relating to the working of the colliery. At the last meeting of shareholders Sir W. Brett distinctly laid down the plan on which it was proposed to work the colliery, and gave a full and clear account of what had been done, and summed up his remarks by saying that the course now proposed by the directors was to work to the full the Garw level; to wait the result of the adjoining property before any further search was made for the Big Bettws or 9 ft. vein, and to acquire adjoining property, under which the upper seam was known to exist, and which could be favourably worked from the present level. After some discussion the shareholders adopted that as the proper course to be pursued, and for the last 12 or 18 months the directors had endeavoured faithfully to carry out the wishes of the shareholders in that respect. It would be observed that in the present report the directors spoke of the difficulties in working the output. Shortly after the meeting last August the coal miners in the district began to give an immense deal of trouble, and it was a matter not only of difficulty but of impossibility to get them to work. They were, therefore, unable to carry on the Garw level to the utmost output; they were in the hands of the labour market, and for six months they went on with an average daily output of 30 or 40 tons. There was plenty of coal to be got out, but they had not the labour to get it out. In December, owing to a strike which had lasted some time, the masters came to the determination to lock out the labourers, but this company had kept aloof from that movement, and had availed themselves to a certain extent of the labour which was thus offered, but owing to the fact that the colliery was not at first prepared to receive a much larger number of men the output did not at first increase quite so rapidly as might have been expected, but by going steadily to work the daily output in the Garw level was increased from 20 tons in the first three months to 34 tons in the second three months, and now the daily output was increased to 83 tons. With regard to the working of the adjoining property and the 9-ft. seam, it seemed that the owners of the property had never undertaken to develop it, owing to the large expense of so doing, and, therefore, this company had not been able to take advantage of anything which had been done. The directors, therefore, turned their attention to the acquisition of a neighbouring property, which they had secured from the vendor on very favourable terms, and from which a considerable quantity of coal had been won of most excellent quality, the price of which ranged 2s. per ton higher than coal now being sold in the neighbourhood. Therefore, they might congratulate themselves upon the acquisition of this property. There have been one or two letters received from different shareholders with reference to the expenses of management, which he would now read; this was a question which occupied the attention of the directors some months ago, and was discussed with some of the shareholders. The directors, to show their sincerity in the matter, had determined to make no claim for remuneration for the current year. He hoped before separating to-day the shareholders would decide to appoint from amongst their own body a small committee to meet the directors and discuss with them the proper course to be adopted for the future. He moved the adoption of the report and accounts.—Mr. SIMMONS seconded the resolution, which was put and carried without any discussion.

Some discussion then ensued with respect to the appointment of a small committee to consult with the directors as to the best course to be adopted in the present position of the company's affairs. The CHAIRMAN said that the directors would very much like that the committee should have before them the engineer and agent, and obtain from them all particulars relative to the chance of finding the 9-ft. vein. He might mention that those gentlemen were not sanguine of success in finding that vein, but at the same time the directors preferred that the committee should learn all the particulars for themselves, and then judge what was best to do. He pointed out that it was absolutely necessary to decide as briefly as possible whether they should stop the operations at the mine, or whether means should be provided to carry on the work. Some discussion ensued, and the almost unanimous feeling of the meeting was in favour of the course suggested by the Chairman, for the appointment of a small committee of consultation.

Some discussion also ensued upon certain details of management, but as the discussion was of no public interest, and as, no doubt, they will be fully discussed in committee, any report of it is of no public interest.

Evening the following resolution was passed:—"That a committee consisting of the following gentlemen—Mr. Hankey and Mr. Collier—with power to add to their number, be hereby appointed for the purpose of co-operating with the directors, in order to devise a scheme in the interest of the future of the colliery, with power, if considered needful, to appoint a mining engineer to assist them in arriving at a satisfactory conclusion."

On the motion of a SHAREHOLDER the following resolution was also passed:—"The shareholders, having heard the explanation of the directors as to what they have done with the property since it has been under their control, and the recommendation of their directors that a committee of co-operation be appointed having been adopted, resolved that this meeting tenders its thanks to the directors for their services, and signifies its approval of the steps they have taken, and hereby

request the directors to continue in office, and to act cordially in conjunction with the committee."

A vote of thanks to the Chairman closed the proceedings.

ABERDARE AND PLYMOUTH IRONWORKS COMPANY.

The adjourned meeting of creditors of this company was held, on Wednesday, at the Cannon-street Hotel.

MR. JOSEPH ROBINSON, of the Ebbw Vale Company, who occupied the chair, said: It is intended to ask you to adjourn this meeting again, and I have only to ask Mr. Travers Smith to state the reason for asking this adjournment.

MR. TRAVERS SMITH, of the London and Westminster Bank, said that those who were present at the last meeting would remember that an adjournment was asked for in the hope that arrangements might be made and, possibly, completed before the day of adjournment came, with a view to carry on their great and important works for the benefit of the shareholders to dispose of it as a going concern if it were found necessary to break up. These negotiations were still of an incomplete character. Those who had conducted them were not without hope of arriving at a satisfactory result, but the details of the work were very complicated. It proved necessary to find money to pay off one of the mortgages on a portion of the works, and the persons asked to provide money were not all ready to do so. It was requisite to investigate the title, as there were other investigations to be carried through, and the matter was not yet terminated successfully. It would be highly disadvantageous that the concern should be broken up, and under the present state of circumstances; and in the hope that that would not be the case it had been determined at a meeting of the larger creditors to agree to propose an adjournment of another month from that day, but with this understanding that if gentlemen would leave their addresses there should be communicated with before the next meeting, so as to inform them whether it would be a proper formal one, or whether at that time a result could be arrived at, so that if the next meeting might be formal they could state when another adjournment might be made to. No mischief had resulted in the meantime, as the works had been carried on by Mr. Turquand, who is very skilful in such matters, as those know who were acquainted with him: and not only the works maintained, but they had been carried on to a great amount of profit. He hoped that the meeting, therefore, would be adjourned for one month.

MR. GALESIDE, one of the directors of the London and Westminster Bank, said the Marquis of Bute would throw no obstacle in the way of the meeting. He had met the creditors in a liberal spirit, and the creditors might be perfectly satisfied on the part of the Marquis of Bute that every assistance that a landlord could offer had been rendered.

MR. TRAVERS SMITH then moved, and MR. RAWLINS, of the London and Joint Stock Bank, seconded a resolution formally adjourning the meeting for one month.

THE CHAIRMAN said he was glad to have heard what had been said. So long as coal was of any value in England—and their property was in the most important district in England, and the quality of the coal was unsurpassed—so long was it of value to the creditors. He hoped that an arrangement would be made, and then every creditor would be paid his due. The Marquis of Bute had behaved in a handsome and liberal way, and for the benefit of the shareholders and the district.

ENGLISH AND AUSTRALIAN COPPER COMPANY (LIMITED).

A half-yearly meeting of shareholders was held at the London Tavern on Thursday.—MR. ROUTH in the chair.

MR. CHARLES B. ROGERS (the secretary) read the notice convening the meeting.

THE CHAIRMAN said that during the six months ending Dec. 31 the gross quantity of ore, regulus, precipitate, and rough copper received from various mines was 6481 tons 12 cwts., as against 7389 tons 11 cwts. for the corresponding six months of the previous year. The quantity of ore, regulus, and precipitate smelted at Port Adelaide and Newcastle works was 6490 tons 6 cwts., as against 6291 tons 14 cwts. The quantity of copper made amounted to 1275 tons 11 cwts., as against 1476 tons 2 cwts.; and the quantity of copper which has been shipped from and sold in Australia was 1258 tons 6 cwts., as against 1476 tons 2 cwts. The net earnings of the company's wharf at Port Adelaide were 1804L. 11s. 11d., as against 1523L. 18s. 3d. Copper, for six months past, has experienced no extreme fluctuations, but there has been a declining tendency almost throughout, in common with the metal trade in general. Notwithstanding this, the consumption has been fairly satisfactory, and stocks at the close of the half-year show but a moderate increase. The statement of the six months' working to Dec. 31, 1874, shows an estimated profit of 8466L. 6s. 7d., to which has to be added 3015L. 9s. 9d., balance on June 30, 1874, making together the sum of 11,481L. 18s. 4d., out of which the directors proposed to declare a dividend of 2s. per share, free of income tax, payable on Sept. 1, and make the usual addition of 10 per cent. to the reserve fund, which now amounts to the sum of 11,010L. 4s. He had had a very few remarks to make; the principal thing to look at was the result, which, he was happy to say, enabled them to recommend a very reasonable dividend for the half-year. At the same time the directors had observed the conservative principle of recommending rather less than they could reasonably have done, and for this reason, that there was a large stock of copper in hand, and knowing that the markets fluctuated, it was deemed advisable they should keep within the mark rather than otherwise. They now came forward with a strong balance, and looking at the general prospects of the current half-year, they hoped to be able to show at the end of the financial year even a better result than that submitted upon the present occasion. Their great object was not to increase the dividends until the amount could be maintained, and to make it as equitable as possible. He felt perfectly justified in congratulating the shareholders upon the present occasion. The quantity of ore received had been less than in the corresponding period, but that, as hitherto, would always fluctuate according to the purchases made by their manager in Australia. The supplies of ore had been very satisfactory, and their manager told them the mines from the far north were likely to be opened up, in which case there would be a still greater field for smelting. The Government were now engaged with the railways, and if they were completed would prove a powerful stimulus to an extension of mining operations. It was impossible to say what quantity of ore would be brought forward, but if the railways should not be completed the supplies would be amply sufficient to keep their works fully employed. He then proposed that a dividend of 2s. per share be declared, free of income tax, on September 1.

A SHAREHOLDER drew attention to the item charged for interest, which was an amount equal to 25 per cent. of the sum proposed to be paid to the shareholders. He suggested as worthy of consideration that the money should be raised in this country at 5 per cent., and transmitted to Australia, thus realising the benefit of 2 per cent. Mr. Frewer mentioned at the last meeting that the 6d. per share undivided was fruitless

now taken up by the shareholders, as the money would be required to put the property in order for washing. There could be no doubt of the bondholders being well secured, they having a first mortgage on all the company's property. He was glad to be able to congratulate the shareholders upon the prospect of the company being able to shortly resume the payment of dividends, which at first could not be expected to be very large, but will be much increased, the superintendent states, as soon as he has opened a good face of gravel for washing. Before concluding, he would read them an extract from a letter received that morning from Mr. Stone:—

"Enclosed I send you the proceeds of one pan of dirt, got, without selection, on bed-rock when drifting through the shaft after it had been tapped by drill. You wish me to drift a little to test it, but I want everything else done first. You need have no fear but that the bottom is good enough in any place around the bottom of the shaft, and it would cost considerable to drift 5 ft. I have no doubt that the lead runs the whole length of the claim."

The following resolutions were carried unanimously:—That the report of the directors and the accounts be, and are hereby, adopted.—That Mr. Wm. Dickason Hotel be, and he is hereby, re-elected a director of this company.—That Mr. Nelson Pitkin Stratton be, and he is hereby, elected a director of this company.—That the remuneration for the services of Mr. William Nutt Field, the auditor of the company, for the past year be \$5, 5s.; and that Mr. Field be elected auditor of the company for the present year.—That the best thanks of the meeting be given to Mr. Hill for his courteous conduct as Chairman of this meeting, to the directors for their general management and attention to the affairs of the company, and to Mr. J. A. Stone, the company's superintendent, for his able and vigorous management of the company's property.

WEST GODOLPHIN MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Great St. Helen's, on Tuesday, Mr. ROBERT WILSON in the chair.

Mr. CHARLES THOMAS (the secretary) read the notice convening the meeting, the statement of accounts for the four months ending August showing a credit balance of 167, 5s, 5d., and the subjoined report of the manager.

Aug. 14.—I herewith hand you statement of work done in the past four months:—The distance driven in the different levels, depth of winze and shafts to the present date, with the value of the lode in the different pitches.—Work done in the past four months:—The 60 has been driven east of the caunter, on Wilson's lode, 5 fms. 5 ft. 9 in. The 60 has been driven east of the caunter, on Wilson's lode, 5 fms. 5 ft. 9 in. The 60 has been driven south-east of Pressure shaft, on the caunter lode, 12 fms. 9 ft. 9 in. The 50 has been driven east of the eastern part of the caunter, on Wilson's lode, 13 fms. 0 ft. 8 in. The 50 has been driven west of the eastern part of the caunter, on Wilson's lode, 1 fm. 2 ft. 3 in. The 50 has been driven south-east of Pressure shaft, on the caunter lode, 1 fm. 3 ft. 11 in. The 50 has been driven north-west of Pressure shaft, on the caunter lode, 3 ft. A winze has been sunk in the 50 east of the eastern part of the caunter, on Wilson's lode, 1 fm. 3 ft. 8 in. The 40 has been driven north-west of Pressure shaft, on the caunter lode, 6 fms. 4 ft. 9 in. The 40 has been driven east of the caunter, on Wilson's lode, 6 fms. 5 ft. 9 in. A winze has been sunk in this level east of the caunter, on Wilson's lode, 8 fms. 5 ft. 3 in. The 40 has been driven west of the caunter, on Wilson's lode, 2 fm. 1 ft. 11 in. The 30 has been driven east of the caunter, on Wilson's lode, 1 fm. 4 ft. 4 in. The 20 has been driven east of the caunter, on Wilson's lode, 3 ft. 6 in. The 20 has been driven south-east of Vivian's shaft, on the eastern lode, 1 fm. 3 ft. The deep adit level has been driven east of the caunter, on Wilson's lode, 3 fms. 5 ft. 8 in. Wilson's shaft has been sunk on Wilson's lode, 5 fms. 5 ft. 9 in. The adit level has been secured north-west of Pressure shaft, and a shallow level driven to raise the water from the adit level in the stampa lat. Value of the lodes, distance driven, and sunk:—The 60 is driven north-west of Pressure shaft, on the caunter lode, 27 fms. 3 ft.; at this point we intersected Wilson's lode, but we have not opened on it to the north side of Wilson's lode. Wilson's lode in the 60, driving east of the caunter, is 4 ft. wide, worth 20 per fathom; distance from caunter, 9 fms. The caunter lode in the 60, driving south-east of Pressure shaft, in 2 ft. wide, worth 50 per fathom; distance from Pressure shaft, 28 fms. 4 ft. Wilson's lode in the 50, driving east of the eastern part of the caunter, is 20 in. wide, worth 6 per fathom; driven east of the eastern part of the caunter, 14 fms. 3 ft. 6 in. Wilson's lode in the 50, west of the eastern part of the caunter, is 3 ft. wide, worth for tin and copper 10 per fathom. Wilson's lode in the 30, west of the winze sinking in the 50, on Wilson's lode, is 4 ft. wide, worth 20 per fathom; sunk 4 fms. 3 ft. Wilson's lode in the 40, driving east of the caunter, is 4 ft. wide, worth 10 per fathom; distant from caunter, 19 fms. 5 ft. A winze has been sunk in this level and communicated with the 60, east of caunter. Wilson's lode in the 40, driving west of the caunter, is 20 in. wide, low-price tinstuff; distance from the caunter, 4 fms. The caunter lode in the 40, driving north-west of Pressure shaft, is small; distance from Pressure shaft, 84 fms. Wilson's lode in the 30 east of the caunter, is in three parts or branches, each about 6 in., with about 1 ft. of kiles between each branch; each of these branches will produce a little tin, and I expect as soon as these branches come together we shall have an improvement in the lode; distance from the caunter, 14 fms. 1 ft. Wilson's lode in the winze sinking in this level, east of the caunter, is 2½ ft. wide, worth 7 per fathom; sunk 7 fms. Wilson's lode in the 20, east of the caunter, is 2 ft. wide, low-price tinstuff; distance from caunter lode 10 fms., suspended. Wilson's lode in the 10, east of the caunter, is 2 ft. wide, low-price tinstuff; distance from the caunter lode, 6 fms. 3 ft., suspended. Wilson's lode in the deep adit level, east of the caunter, is small, distance from the caunter 23 fms., suspended. Wilson's lode is sunk from surface 13 fms. 3 ft.; the lode in the bottom of the shaft is about 20 ft. wide, producing a little tin throughout, but not rich enough to pay with the present price of tin. We have working on tribute on the caunter and Pink lodes seven men at 7s. in 1/2, two men at 8s. in 1/2, four men at 8s. 6d. in 1/2, and 17 men at 10s. in 1/2, at a standard of 45s. per ton for the tin. We have employed on the mine 5 ft. men 17 boys 19 girls—122. Since our last general meeting we have laid open some valuable ground on Wilson's lode, east of the caunter, which we shall be able to stop to good advantage as soon as the different winzes are holed to the various levels. The value of our lodes may easily be seen by referring to our monthly sales of tin, and the number of stamps heads that we have working. I calculate our next sale of tin will be about 11 tons. I have reduced our cost as much as possible, and I think our cost for this month's working will not exceed 470.—John Pope.

The CHAIRMAN, in moving the reception and adoption of the report and accounts, remarked that they had heard the report read, and he thought they would all agree with him that it was a very satisfactory one; they had really very little to add to what was contained in the report, and he could only congratulate them that, notwithstanding the low price of tin, they had been able during the past four months to make a profit. Wilson's lode was opening out well, and all they wanted to ensure satisfactory progress was an advance in the price of tin. As it was they had a profit of 65. He was glad to say that on this occasion they would not have to make a call, and he hoped in the next four months to do at least as well. He would be happy to answer any enquiry that might be made, and would, therefore, formally move the reception of the report.

A SHAREHOLDER remarked that there had been a great fall in wages, men to whom they had been paying 10s. per day in Scotland now accepting 5s. per day.

The SECRETARY said that their men had certainly not been earning too high wages; their workmen had taken a little over 4/- per month, and they had 30 men working on tribute who had only received 6/- per month, but this was, of course, a matter of accident, and they might fully compensate for it by the next month's work.

The CHAIRMAN remarked that had their accounts been made up to the day of the meeting they would have shown better results than those presented. Their assets, including the tin and copper sold, amounted to 717/-, and their total liabilities were but 579/-, 10s. 11d., so that that they were in a considerably better position. There was but 16/- due on the last call, and all previous call had been fully paid up, so that they could not complain on that account.

The motion for the adoption of the report and accounts was then put to the meeting, and carried unanimously, and thanks having been voted to the Chairman the proceedings terminated.

CARN BREA MINING COMPANY.

A three-monthly meeting of adventurers was held at the mine on Wednesday, Capt. TEAGUE in the chair. The accounts showed that for the three months ending March the labour costs amounted to £435/-, and the merchants' bills to 2976/-, the total liabilities amounting to 10,858/- On the other side 197 tons of tin realised 9512/-, the total assets being 10,224/- This showed a loss on the quarter of £64/-, and after deducting this amount from the balance in hand at the last meeting, amounting to 4305/-, there is a balance in hand of 3671/-.

The agents reported that the cross-course winze is sunk to the 250 fm. level; the lode, so far as seen, is of a most promising appearance, and yielding good work for tin. We hope to commence the driving of the 250 fm. level, east and west of this winze, as soon as the lift is fixed, which will take two or three weeks from this time. In the 238, driving west of the cross-course winze, the lode is worth for tin 16/- per fathom—a most kindly lode. In the 228, driving east of the cross-course winze, the lode is worth for tin about 25/- per fathom. In the 226, driving east of the winze, the lode is worth for tin 28/- per fathom. In the 226, driving west of the winze, the lode is worth for tin 35/- per fathom. Highbrow west shaft is sunk to the 226 fm. level; the lode has much improved during the last 2 or 3 fathoms sinking, being now worth fully 28/- per fathom. In the 215, driving west of Highbrow west shaft, the lode is worth for tin 10/- per fathom. In the 215, driving east of Highbrow east shaft, the lode is yielding good work for tin.—Teague's Lode: In the 308, driving west of the old engine-shaft, the lode is of a most promising appearance, and yielding good work for tin in the 105, driving west of sump shaft, the lode is very large, and worth for tin 12/- per fathom. In the 180, driving west of the sump shaft, the lode is worth for tin 10/- per fathom. The 155, east of sump shaft, is without alteration since our last. In the 125, driving east of sump shaft, the lode is worth for tin 10/- per fathom. As to the Druid lode, the 193, driving east of new shaft, it had not improved as expected, nor were they so far east as to take the run of ore ground seen in the level above. In the clearing of Manscourt shaft they had not made the progress anticipated, the breakage having extended 10 fathoms beyond the point expected. The 125, driving east of Manscourt shaft, was without alteration, and they hoped to resume the driving of the intermediate levels during the next two months, when they were very sanguine of making good discoveries. They were sorry the result of their quarter's working had not been more satisfactory, the price of tin alone making on the quantity sold a difference of 10/- per ton, or a sum of nearly 2000. But they were not without hope. The lowest price for tin had been reached for the present.

Capt. TEAGUE said the lodes were not rich, but there was any quantity of metal in the mine.—Mr. HIGGINS (Liskeard) was glad to see that Capt. Teague considered that they had seen the worst of the tin trade for some time. They should be thankful that, amid so much depression, the mine continued so well. Those

who had the management of Carn Brea must have felt considerably embarrassed under present circumstances, but they had, notwithstanding, managed the mine exceedingly well, and, therefore, he had much pleasure in proposing, "That their best thanks be given to Capt. Teague and the agents of the mine for the zeal and ability displayed in its management."—Mr. T. B. HALL seconded this, and it was carried unanimously.

Capt. TEAGUE, in acknowledging it, said he was glad to have their confidence. Tincroft, he thought, was about as good a mine as any in the county; and as regarded Carn Brea, he did not despair about it turning out all right. He should not be discouraged even if they had to pay calls for Carn Brea. He would pay them cheerfully. He could not divest himself of the belief that a mine like Carn Brea, having so many lodes, and such a run of ground on each lode, must improve. There were certain to be improvements, and that was pretty much to say. He believed that the price of tin would eventually improve, and that to a greater extent than he had intimated in the report. One satisfactory feature in the tin trade was the great consumption, and while Australia continued to produce the same quantity as at present Cornwall had a fair chance of getting rid of all its tin at a good price. The consumption of tin was never so much as at present. Considering that the tin trade had languished with other trades, and that there was every reason to expect a general improvement, he thought there was a good prospect for the tin trade.

TINCROFT MINING COMPANY.

The three-monthly meeting of adventurers was held at the mine on Wednesday—Capt. W. TEAGUE (purser and manager), presiding.

The accounts for the three months ending March showed that the labour costs amounted to £300/-, the merchants' bills to 2300/-, and that the total liabilities were 7597/- 17s. 8d. On the other side 193 tons of tin realised 9082/-, and with the extra carriage of black tin, the assets reached 9108/-, leaving a profit on the quarter's working of 1510/- Added to this 95/- balance from the last meeting, an available balance was thus shown of 1605/- 15s. 5d. A dividend of 5s. per share was declared.

The agents reported that in the 234, driving west of engine-shaft, the lode is yielding saving work for tin. In the 234, driving east of engine-shaft, the lode is worth for tin 7/- per fathom. In the 210, driving east of Martin's east shaft, the lode is worth for tin 10/- per fathom. In the 198, east of Martin's east shaft, the lode is worth for tin 8/- per fathom.—Chappell's Lode: The lode in Downton's shaft, sinking under the 246, is worth for tin 10/- per fathom. In the 246, driving west of Downton's shaft, the lode is worth for tin 25/- per fathom. In the 246, driving east of shaft, the lode is worth for tin 10/- per fathom. In the 234, west of Downton's shaft, the lode is worth for tin 80/- per fathom. In the 212, driving east of shaft, the lode is worth for tin 12/- per fathom.—Dunkin's Lode: In the 180, driving west of man-engine shaft, the lode is worth for tin 7/- per fathom. In the 180, driving east of man-engine shaft, the lode is worth for tin 10/- per fathom. In the 140, driving east of man-engine shaft, the lode is producing saving work for tin. There is no alteration at North Tincroft since our last. We are very sorry the price of tin is such as to prevent better results from the quantity sold, but we are inclined to think the worst is passed for the present.

SOUTH WHEAL CROFTY MINING COMPANY.

The three-monthly meeting of shareholders was held at the mine on Wednesday, the purser (Mr. E. HEARLE RODD) presiding. This mine seems to be making headway, notwithstanding the low price of tin, a profit of 54/- being shown on the three months' working. The accounts were:—Labour costs paid for the three months ending June 5, 2269/-; merchants' bills, 1256/-; interest and commission (six months), 89/-; total costs, 3614/- Receipts for sales of copper, 1366/-; receipts for sales of tin, 1649/-; receipts for sales of arsenic, 795/- total, 3810/- less lords' dues, 151/-—3658/- Old steel sold, 9/- Profit on the three months, 54/- deducted from the debit balance at last account, leaves a present balance against the mine of 997/-

The agents, Capts. J. Thomas, J. Johns, and J. Jory, stated in their report that the lode in Bickford's shaft, sinking under the 195, had improved in appearance and quality, and was now worth for the length of the shaft, 12 ft., 30/- per fathom; this shaft is being sunk as rapidly as possible by eight men and four boys, and the agents are looking forward with interest to the junction between Pryce's and the south lode, which they suppose cannot be far distant, but may be met with shortly. At the 195, south of Bickford's shaft, the south lode has been driven through, and at this point found to be 4 fms. wide, containing a little tin. The 170, east of cross-course, on the south lode, is worth 10/- per fathom. The 180, east of Pryce's lode, is about 10 fms. east of Bickford's shaft, and is worth 12/- per fathom. In the 180, east of cross-cut, the lode is small and unproductive, but at the west of cross-cut the lode produces fine stones of tin and copper, worth about 10/- per fm. The rise over the 50, on Pryce's lode, is worth 12/- per fathom.

The meeting was thinly attended, and very short.

Mr. RODD stated that the returns of arsenic would be as large the next quarter as they have been at all.—*Western Morning News.*

NEW CWM ELAN.—At the meeting, on Thursday, it was mentioned that since the formation of the undertaking operations had been chiefly directed to the development of the mine, which had, nevertheless, produced sufficient ore to pay the working expenses, except cash paid for actual works of development.

VAN RAILWAY.—At the general meeting held at the offices of the Van Mine, near Llanidloes, on Thursday, Mr. A. R. Boughton-Knight (vice-Chairman) in the chair, the report of the directors (which has already appeared in the Journal) was taken as read. The expenditure on capital account during the half-year ending June 30 had been 206,178s. 8d., raising the outlay on that account to 21,057/- 10s. 9d., or 1067/- 19s. 9d. in excess of share capital. The net revenue account showed a credit balance of 550/- 4s. 8d., which, added to the balance left over from last year, makes 1681/- 18s. 8d. The report was adopted, and a dividend at the rate of 4 per cent. per annum declared, absorbing 400/-, leaving a balance to carry over of 213, 18s. 11d. Messrs. G. Batters, W. Page, and D. Davies, M.P., the retiring directors, were re-elected, and Mr. Powell was re-elected auditor. A vote of thanks to the Chairman and directors closed the proceedings.

CALDBECK FELLS MINING COMPANY.—The half-yearly general meeting of shareholders will be held at Carlisle on Aug. 30, when the accounts showing a loss of 1172/- 10s. 8d., and the report, of which the subjoined is an abstract, will be presented:—The directors have again to regret a loss on the working of the mine of the sum of 721/- 16s. 6d., and debenture interest, 450/- 1s. 2d.—1172/- 10s. 8d. The only items charged to capital are the cost of the new pump and boiler, and the cost of the debenture stock certificates; the expense of carting and erecting the former, and of collecting the debenture stock have both been charged to revenue. With regard to the condition and prospects of the mine, the report of Capt. Polglase gives details of the work done, and explains cause of loss. The prospects are brighter, seeing that during the last two months the sales of ore have at least met the working expenditure and royalty. Under these circumstances it is proposed to defer payment of interest on debenture stock to end of the year. Capt. J. Polglase, after reporting on the various points of operation, writes that the lodes at the different points of operation he values thus:—Sinking below the 20 the east lode is worth 23/- per fathom; stopes in back of 20, east worth 20/- per fathom; stopes in back of 20, west shaft, 90 end west producing stones of lead. No. 1 stope in the back of 20, east worth 24/- per fathom; No. 3 stope worth 20/- per fathom. There are two principal points of interest before them—the sinking of the shaft below the 20, and the driving of the 90 west, both being in whole ground. Upon these two points depends our future. The lode in the shaft is looking well, and the 90 end is not without ore, but not sufficient to value. A more promising lode is on the 20, east of the 20, west shaft, the lode is also maintaining its length and size, but has less and less pay ore as it gets deeper; that the North Cliff, east of its junction with South Cliff, did not get down to No. 5, and that what little

there has been found at the No. 6 is of very low grade.

They also find that the decrease in the value of the ore in free gold has not caused a corresponding increase in the value of the sulphurite, and the decrease must be accounted for from the fact that there is less gold contained in the ore. These facts taken alone do not favourably for the future. There are, however, other facts which must be taken into consideration, and facts that will be found much more encouraging. The fact that a vein has produced large bodies of rich ore is the strongest possible evidence that it will produce them again, especially when the vein is a large and permanent one. Every shoot of ore must have an ending as well as a beginning, and the probabilities for finding a shoot of pay ore are very much greater in a vein that is known to be productive than in one that is not so known. Instances might be multiplied of the discoveries of new and rich ore shoots in productive veins; in fact, this is the rule, and there are no reasons why the Sierra Buttes should be an exception. Taking into consideration the size of the veins, their permanent character and their productive capacity, they will, without a multiplicity of words, say that they believe and expect that large paying bodies of ore will be found by the running of the seventh level. The Reis mill, with occasional repairs, is yet capable of doing

a large amount of work; Hanks and Hitchcock mills in excellent condition. During the year ending June, 49,821 tons of ore yielded 2356,42c, being a little over \$7.15 per ton. The yield per ton was at Hanks, \$7.55; at Hitchcock, \$6.99; and at Reis, \$6.52. The mills are equally good. The saving of gold depends almost entirely on the ability and attention of the person in charge in keeping the conditions and appliances for saving gold in proper order, and this is especially so where the ore is of low grade. The assay value of the tailings is \$3.75 per ton, and they can, no doubt, be profitably worked by re-concentration and grinding in pans.

At PLUMAS EUREKA the explorations since July, 1874, consist in the running of the Mammoth tunnel 241 ft.; the Catlin tunnel, 160 ft. south, and 90 ft. north; the Middle tunnel, 257 ft.; the Harper level, 80 ft.; and in sinking a winze from Catlin, 67 ft.; making a rise in the north end of the shoot in the Mammoth, 72 ft.; and in running a cross-cut east from the Mammoth, 100 ft. The future prospects are very encouraging. There is a large amount of ground yet unexplored by the Mammoth and Catlin levels, and ground, too, that has proved, and is proving, to be very good in the Harper level, and there are no reasons for believing other than that this unproved ground will be found to be very profitable. The break in the Clamper shoot, below the Catlin level, may only be temporary; but, admitting that it is permanent, it should cause no discouragement, for there is ample room yet, south of end of Mammoth tunnel, for the making of a long and profitable shoot of ore, and there is very good reason to expect such a shoot of ore in this tunnel. The tunnel is not yet south far enough to

INFLAMMABILITY OF COALS—ARTIFICIAL CHARCOAL.

Different fuels differ widely in their inflammability. Wood charcoal and coke form the greatest contrast in this respect; the former ignites easily and continues to burn, the latter kindles with difficulty and quickly goes out in the air. Gas cokes are more combustible than the coke of metallurgical works; the so-called Saar coke is more combustible than the Ruh coke. These differences are probably due to molecular arrangement of the particles, to their density, and to their power of conducting heat. The denser the substance, depending as it does on the temperature at which it was prepared, the better conductor of heat and electricity it will be and the more rapidly will the heat developed at one point spread throughout the whole mass. And, moreover, the denser the substance the fewer points of attack will be offered to the oxygen of the air, and the less heat can be generated in a unit of time at a given point. If heat is applied to a small spot on a large piece of dense (hard, heavy) coal for the purpose of igniting it, a comparatively strong source of heat will be required to bring it to a glow or ignite it. It does not continue to burn after the source of heat is removed, because the whole of the heat is rapidly distributed throughout the whole mass, and the heat newly generated by the combination of oxygen with the glowing coal is not sufficient to keep the temperature up to the burning point. A piece of coke ignited at one spot becomes black almost immediately after removing the source of heat. In like manner a piece of coke ignited throughout its mass, when taken from a stove, soon goes out, because the loss of heat by radiation from the whole surface and by connection on the air, is greater than the heat produced on the surfaces in the same time by combustion. Even blowing which is employed with wood charcoal to stir up and quicken the flame, with small pieces of ignited coke, hastens its extinction.

The inflammability of a coal may be defined to be the ease with which a small piece becomes ignited or reaches its igniting temperature when exposed to a source of heat in the open air, and continues to burn after the source of heat is removed. The igniting temperature itself—*i.e.*, the temperature at which the glowing mass combines with the oxygen of the air—may be considered equal for all kinds of coke. Charcoal burned in pits in the forests, and used in different industries, wherever it is desired to keep a moderate and flameless fire, has different faults, which in many cases are found unpleasant. The chief of these is that incompletely burned pieces (brands) give out a dangerous gas, so that it is impossible to keep a fire in an open space without a pipe to convey the gases into a chimney. Beside this, charcoal sometimes cracks and snaps, throwing out sparks, which renders an open fire dangerous. And further, charcoal is not so easily ignited that a small fire can be started readily unless the coal is first brought to a glow in another fire; nor does the fire spread over the whole mass when lighted at one end, but goes out unless a blast of air is thrown on it, or a number of pieces are piled up together. It is impossible to keep a steady small charcoal fire for several hours in the open air.

Dr. Meidinger, in an interesting paper in "Dingler's Journal," states that within the last few years there has been introduced into the European market a prepared charcoal, which is free from these faults, and to a certain extent, may be considered as a new and valuable fuel. The substance burns without smoke, does not throw out sparks; ignited at one spot, the fire spreads slowly over the whole mass, and a perfectly steady fire may be kept for many hours, according to the size of the pieces. As far as is now known this fuel is made of pulverised charcoal, to which is added a small quantity of saltpetre and an adhesive substance like gum. The high percentage of ash (four or five times that of charcoal) indicates that clay is also mixed with it. The oxygen in the saltpetre causes the combustion to continue when once started, and probably renders it smokeless. The products of combustion are not entirely odourless; in our sample there was a characteristic odour of ammonia perceptible. The production of carbonic oxide is not probable, at least so long as a single piece burns in the open air. Some samples evolved the unpleasant stupefying smell which always accompanies the combustion of charcoal. "Saward's Coal Trade Journal," which publishes the abridged translation whence these particulars are obtained, observes that the author goes on to state that he does not know who was the inventor of this pressed coal, that he first met with it in 1869 as a French product; that he afterwards obtained some with an English label "combustible stoker." In conclusion, he gives the result of several experiments with different specimens. The calorific effect he puts in one case at about 6400 units, the specific gravity at 0.8, the price 1 franc for 10 pieces 4 in. long, 1.5 in. wide, and three-fifths of an inch thick, weighing 26 grammes. The ash amounted 12 per cent. Other specimens gave different results.

A NEW QUARTZ CRUSHER.—We have examined a novel quartz crushing machine, which is constructed on a principle entirely different from anything now in use. It is the invention of Mr. Stephen Kendall, who formerly resided in the vicinity of Jackson, Amador county, and who is an old mining man. The machine is a quartz battery, which is double acting, in somewhat the following manner:—Two ordinary mortars are placed on a frame a short distance apart. Between these two mortars is suspended by a journal, a swinging frame, which extends above and below the base. The portion which extends above consists of a semi circular bar or stamp stem, which is supported by arms from a shaft underneath, in such a manner that when it is oscillated upon the journal or shaft its ends will alternately enter the mortars. Each end of this semi-circular bar carries an ordinary stamp shoe, which strikes the dies in the mortars. The portion which swings below the base consists of an oval frame, and inside of the oval frame is arranged a cam on a shaft, so that when the cam shaft rotates the cam will strike the opposite sides of the oval frame alternately, and thus throws it back and forth, producing a swinging motion to the suspended frame, which causes the stamps to alternately strike at the mortars. In the present instance there are four of these stamp stems, and as there are shoes at each end of each stamp stem it makes an eight stamp battery. It takes very little power to operate this contrivance, and there is no expensive frame and complicated machinery about it. It is quite compact, and its weight and cost, as compared with an old style mill doing the same work, is much less. This one could all be put on a wagon, stamp, bed, frame, and all, and it could be set up in 24 hours with ease. Mr. Kendall's main idea in getting this up was to provide a practical cheap mill which will answer the purposes of workmen with no capital. There are many mines in the mountains which are now idle for want of reduction works, which would be worked if cheap crushing appliances were available. Mr. Kendall thinks that this little mill will just answer this purpose, and he is now building a few to be sent to mines of this character. Of course for large mills the stamp stems could be made larger and heavier, and any number of them could be employed as circumstances require. There is very little to get out of order, and the whole thing occupies a space of only 7 ft. by 3 ft., 5 in., and 3 ft. high. The mill can be made all in small pieces, so as to be packed on a mule to mountainous regions. Four stamp mills of this pattern are now being made, which will take the place of arrastras at small mines, as they will have more than double the capacity, and will require no more power to run them. Something of this character has long been needed by working miners for their own claims, and those interested will look to further practical experiments with the hope that the machine will "all the bill." The mill can be seen in operation daily between twelve and one o'clock at the locality mentioned.—*Mining and Scientific Press* (San Francisco).

REPAIRING BROKEN SHAFTS.—The invention of Mr. C. TURNER, of Southampton, mainly consists in arrangements for repairing broken shafts of machinery of various kinds, and also broken pipes. One form of coupling consists of two main parts, a gland and driving socket or stuffing-box, said two main parts being divided in two parts, connected together by incised teeth. When applied to a shaft the gland and driving socket are placed on the shaft in their two parts and driven up tight. Packings of india-rubber are introduced, and also at each end are dished rings of soft metal with a ring of leather in the middle. Bolts (compound) are used for uniting the gland and the driving socket. The soft metal rings inside the gland prevent the packing squeezing out at the ends, and the india-rubber packing is compressed and forced into V grooves, which are formed on the shaft and the socket. Instead of one gland two may be used, and a double end driving socket and ordinary bolts with double screwed ends are used instead of the compound ones. Another form of coupling consists in it being formed in two parts consisting of iron recessed rings, each ring being united together by dove-tailed keys. Into these iron rings tapering rings of soft metal are introduced, the recesses being turned slightly oval, to prevent soft metal from tearing round.

PREVENTING RAILWAY ACCIDENTS.—The invention of Mr. JOHN BATH, of King William-street, has for its object an improved method of coupling or connecting the carriages of a train together (in addition to the ordinary couplings or otherwise), so that should an accident occur to the axles or wheels of either of the intermediate carriages of the train it will be supported by the adjoining carriages to which it is connected, and thus prevented from sinking or leaving the line of railway owing to its want of support upon either or all of its wheels.

IMPROVEMENTS IN STEAM-ENGINES.—The invention of Mr. A. S. CAMERON, of New York, relates firstly to improvements in expansion gear for steam-engines working with slide valves. He employs cut-off valves in combination with the main slide valve of a steam-engine, steam being admitted to the cylinder of the engine through openings in or through the said main slide valve, which openings are controlled by the said cut-off valves. The second part of his

invention relates to means whereby a pumping engine can be constructed to work expansively by proportioning the movement of the pump plungers or pistons relatively to the movement of the steam piston, so as to compensate for the gradually diminishing pressure in the steam cylinder.

DAVIS'S MINING AND SURVEYING ANEROID.



This instrument has been brought out and manufactured by the firm of Messrs. JOHN DAVIS and SON, All Saints' Works, Derby, specially for the use of mining engineers and surveyors, for the purpose of readily ascertaining slight variations in gradients, levels, &c., and, from its extreme sensitiveness, will be found of considerable utility in mining and surveying work generally. Besides its extreme sensitiveness, the speciality claimed for the instrument is an arrangement of the scale of altitudes, which admits of subdivision of a vernier, hitherto impracticable, owing to the altitude scale in ordinary use being a gradually diminishing one, to which a vernier cannot be applied. In the present instrument the action has been so adjusted as to give accurate readings upon a regular scale of altitudes, the barometrical scale of inches being made progressive in length, so as to afford the correct relative readings with the scale of altitudes. For mining operations the entire circle of the dial is graduated to represent 6 in. of the mercurial column—that is, from 27" to 33". This scale affords observations from about 2000 ft. below sea level to 4000 ft. above. The finest division of the altitude scale (1-100th) represent 10 feet measurement, which can be again divided by the vernier scale to single feet. The vernier scale is moved by rack-work adjustment, and a lens, which rotates on the outer circumference of the instrument, facilitates the reading of minute quantities. For surface surveying purposes, where it is not required to be used below sea level, the instrument is made with the scale divided from 25 to 31 in.—thus giving an altitude scale of 6000 ft. above the sea level only; and with this open scale, and the assistance of the vernier, the same minute readings to single feet may easily be taken. The instruments are also constructed for measuring much greater altitudes—that is 10,000, 15,000, or 20,000 ft.—but with these scales the measurement cannot be made quite so minute as in the more open scales. The instrument is 4½ inches in diameter, and is provided with a leather sling case—thus making it sufficiently portable for all practicable purposes.

MINING AND QUARRYING MACHINERY.—Some improvements in machinery for mining and quarrying, parts of which improvements are also applicable to steam-engines, and to air-blowing or compressing engines for other purposes, have been invented by Mr. G. STEVENSON, of Airdrie. The first part of the invention relates to the compressing of air by machinery on the surface, such air being conveyed by pipes to the machines in the mine or quarry for excavating or getting the coal or other mineral; and one improvement consists in leading the exhaust air from the working machines back by a second line of piping to the compressing engine. In one modification of the compressing apparatus there are two vertical air cylinders, which, with their air casings or receivers, form the lower part or base, and so dispense with a large part of the weight of base-plates and foundations that are otherwise required. Each compressing piston is worked by four rods passing up through long pipes, which serve as guides to a frame head, to which are attached one or more rods appertaining to an overhead inverted steam cylinder. The second part of the invention relates to modifications of the steam machinery for pumping water from the mine or quarry. The pump-rods are connected to the overhanging ends of two horizontal beams placed one a little below the other. The upper beam is centered at its middle, and at its back end it is connected by links to a point of the upper beam half as far behind the centre thereof as its front connection to the pump-rod is before that centre. In another modification the alternately acting pump-rods are connected to race bars gearing on opposite sides of a pinion, actuated by an automatically reversing arrangement of steam-engine. The third part of the invention relates to improved mechanism for regulating the speed of the pumping and other heavy engines, the said improved mechanism being also such as to immediately stop them acquiring increased speed. The fourth part of the invention relates to the conveying, carrying, or raising of the minerals or materials in or from the mine or quarry.

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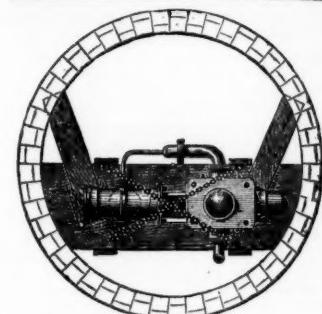
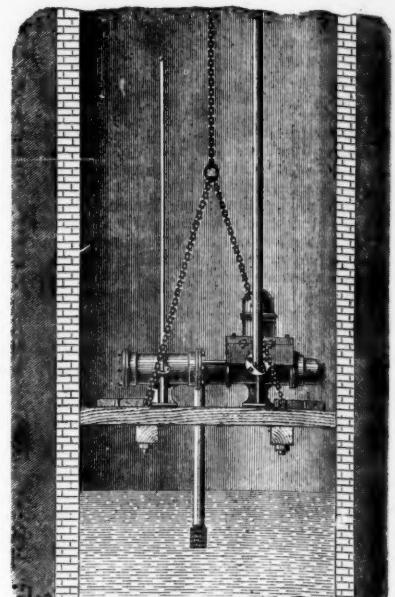
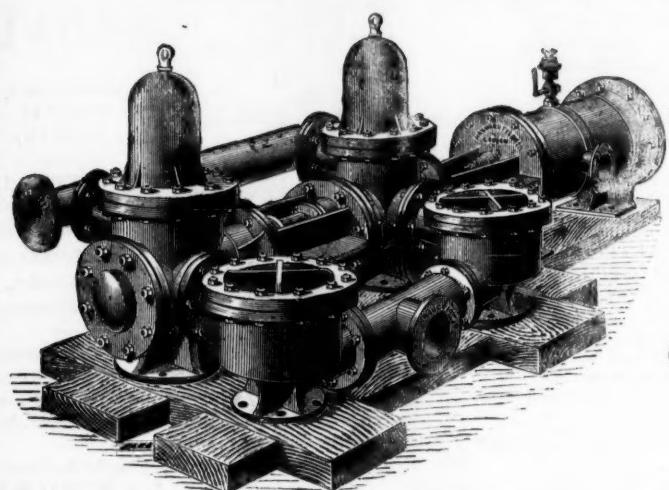
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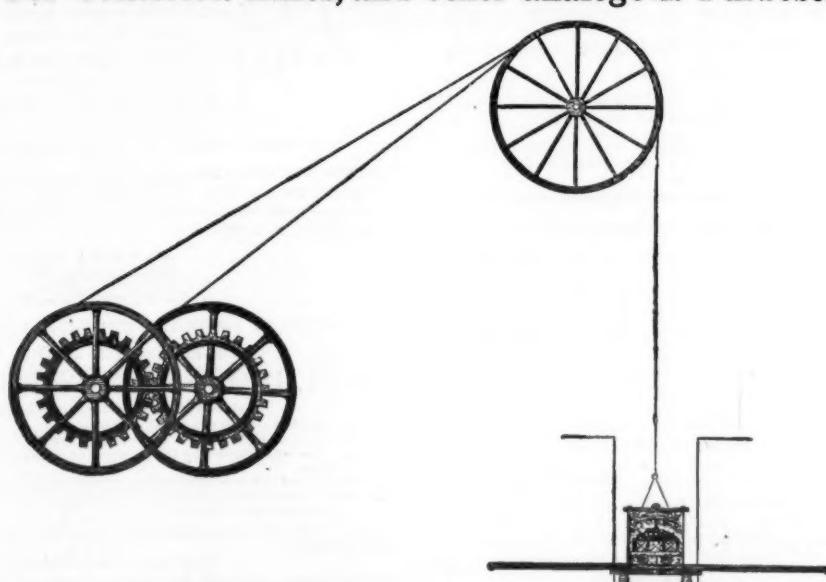
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COPY OF TESTIMONIAL FROM THE ENGINEER, BLANZY MINES, FRANCE. Feb. 25, 1875.

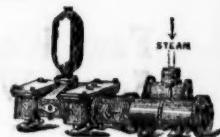
I hereby certify that the new Rock Drill of C. Levet's System has worked at the Blanzy Mines since Nov. 20 without there being the slightest necessity for repair. Its results up to this date have been superior to the other Rock Drills employed in the said mines. (Signed)

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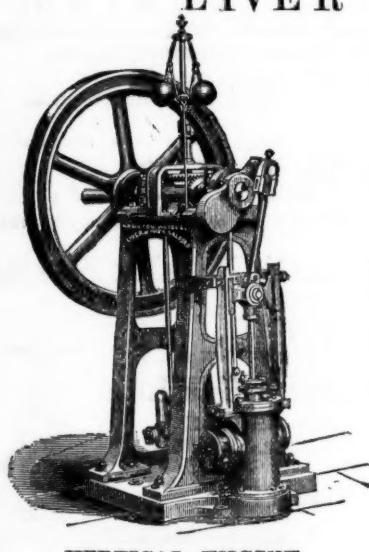
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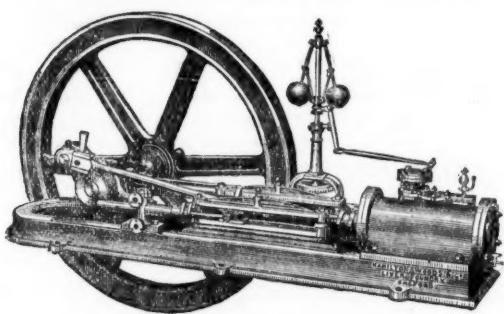
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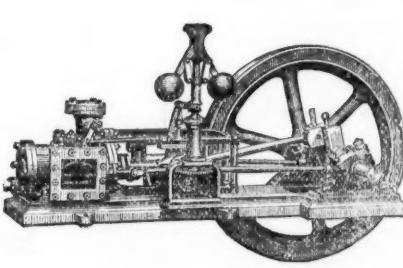
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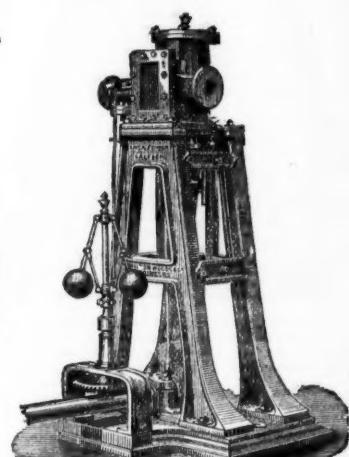
VERTICAL ENGINE.



HORIZONTAL ENGINE.



HORIZONTAL ENGINE.



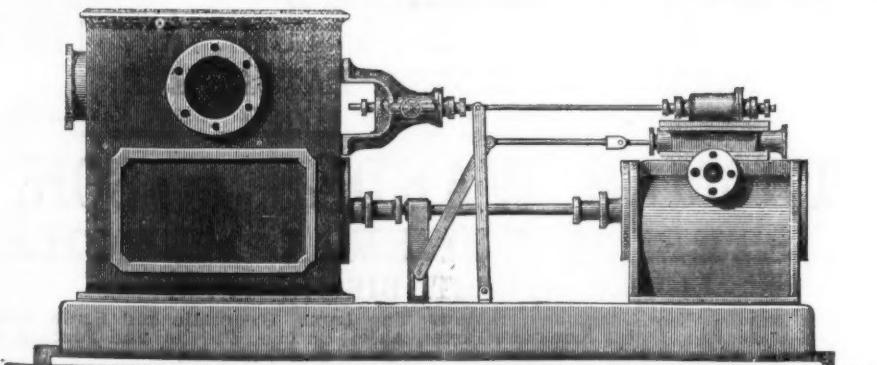
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Horse Power Nom.	Horse Power Ind.	Diam. of Cylin.	Length of Stroke.	Price of Engines	Feed Pump Extra.	Variable Expansion Gear.
6	15	7½	13	62	5 0	12
8	20	9	18	80	6 0	15
10	26	10½	21	105	7 0	18
12	36	12	24	120	8 0	20
16	48	14	30	150	10 0	24
20	60	16	36	190	10 0	24
30	100	19	39	285	12 0	30

Horse Power Nom.	Horse Power Ind.	Diam. of Cylin.	Length of Stroke.	Price of Engines	Feed Pump Extra.
2	5	4½	9	30	3 0
3	7½	5½	10	37	3 10
4	10	6½	10	44	4 0

Horse Power Nom.	Horse Power Ind.	Diam. of Cylin.	Length of Stroke.	Price of Engines	Feed Pump Extra.
6	16	8	13	70	6 0
12	36	12	24	140	8 0
18	54	15	33	200	12 0

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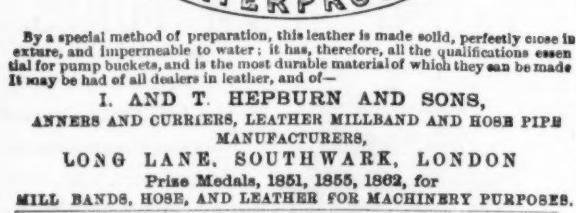
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